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NO. 25

LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interest of Lake Carriers, and improve the character of the service rendered to the public.

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as great as that of the iron ores. In 1872 there was produced of pig iron 2,548,713 gross tons, while the production in 1890 reached 9,202,703 gross tons. There was about one-third of the quantity of pig iron produced in the United States in 1872 as was produced in Great Britain. In 1890 the United States for the first time in its history exceeded Great Britain in the production of this great article of commerce. The United States is now producing more than one-third of all the pig iron produced in the world. Omitting Great Britain, its production is nearly equal to the production of all the other nations upon the face of the globe. In steel it produces 34 per cent of the entire production of the world, or nearly as much, omitting Great Britain, as the other portion of the world. So in the great articles, going into iron and steel production, it produces in iron ore 28 per cent, in coal 27 per cent, in pig iron 33 per cent, in steel 34 per cent.

If it had been necessary to buy the steel rails that have been used outside of the country the United States would have been bankrupt. These rails have been largely produced at home, and it is not likely that one per cent of the rails that will be necessary for the renewal from wear and tear and from the extension of railroads will be manufactured outside of the mills of the United States.

AN ELECTRIC LIGHT-HOUSE.

The present Fire Island light on the south shore of Long Island, N. Y., is shortly to be replaced by a great electric light, said to be the largest ever made. It is claimed that it will have a brilliancy equal to twenty-five millions of candles. The light-house is 168 feet high and it is expected the light can be seen at a distance of 25 miles.

MERITED PROMOTION.

By recommendation of Jared A. Smith, Corps of Engineers, U. S. A., Engineer of 10th Light-House District Mr. J. P. Bumpus has been promoted by the Light-House Board, to Superintendent of Construction in the 10th Light-House District. This is a most worthy appointment and Mr. Bumpus is fully competent to fill the position.

NOTICE TO MARINERS.

UNITED STATES OF AMERICA—NORTHERN LAKES AND RIVERS—WISCONSIN.

SHEBOYGAN PIERHEAD LIGHT-STATION. Notice is hereby given that, on or about June 23, 1894, Sheboygan Pierhead (front) Light (fixed red) will be moved 92 feet nearer the outer end of the N. pier at the entrance to Sheboygan Harbor, W. side of Lake Michigan, Wisconsin, and exhibited from a lantern in the inclosed glazed end of an elevated conduit extending shoreward 264 feet to the Pierhead Light-Tower. The distance between the lights will then be about 270 feet, and the lights will, as heretofore, form a range for approaching the harbor, the range line approximating the line of direction of the outer end of the N. pier.

The focal plane of the light will be 23 feet above the mean level of the lake.

The lens lantern will be replaced by a lantern; otherwise the characteristics of the light will not be changed.

By order of the Light-House Board.

JAMES A. GREER,

Rear-Admiral U. S. Navy, Chairman.

Office of the Light-House Board, Washington, D. C., June 13, 1894.

BRIDGING THE HUDSON.

It is announced that the first steps toward building the North river bridge will be the making of traffic contracts between the bridge company and various roads on the west side of the river. The contracts will be the basis for earnings and for the sale of the company's bonds. The bridge alone is expected to cost between \$15,000,000 and \$20,000,000.

On June 5 the United States Senate passed an amended bill, authorizing the construction of the bridge, and placing the matter in the hands of Secretary of War, as regards approval of the recommendations of the Board of Engineers. On June 6 the House of Representatives passed it, and it has been signed by the President. A period of ten years is allowed for the completion of the structure.

When this bridge is erected the Forth bridge will have to take second place, the new bridge having a central span over 400 feet longer than that of the Scotch structure. It is the design of the Union Bridge Co., of New York.

Each of the two main piers, which are of steel rise 536 feet above high water. The top of the supporting cones are 30 feet above it.

The piers rise with a parabolic curve, concave outward. The floor has a similar curve lying in the horizontal plane, as it narrows from a width of 140 feet at the pier to a width of 80 feet before the central truss is reached. The effect of this is peculiar. It brings the upper tension members into absolute parallelism throughout. These in contour resemble the cables of a suspension bridge, and each occupies a vertical plane. There are other tension members, roughly speaking, of the reverse contour, running from three intermediate points on the pier risers to three points on the bottom chord of the bridge. The disposition is such that each of these members is parallel with the corresponding ones on the other side, starting from points on the pier where it is of widths equal to the widths of the floor at the points where each tension member terminates.

The central truss carried by the cantilevers is 720 feet long and 160 feet in depth.

AN ELECTRICAL SELF-ACTING RUDDER FOR SHIPS.

An interesting device by Mr. Bersier is described in *L'Ind. Elec.* The object is to operate the rudder of large vessels automatically by the compass directly without the use of the usual seaman. Attention is called to the fact that the errors in the ordinary method are scarcely less than from 1 to 2 degrees, corresponding to a lateral error of about 12 miles per day. With the present method greater accuracy is said to be possible; the standard compass is used and a current from a Ruhmkorff coil is passed from the pivot of the needle to the north pole extremity, whence sparks of 3 millimeters' length pass to one of two semi-circular pieces of aluminum insulated from each other, the gap between them being set to the desired sailing direction. When the spark passes to one of these the current, by means of a relay, starts a motor in one direction, which in turn operates the rudder, while if the spark passes to the other piece, it moves the rudder in the other direction. The apparatus has been in use for two months on the steamer Neptune, and it operated very successfully. An additional device is mentioned, in which these sparks pass through a strip of paper, by means of which the record is automatically kept.

MR. JAMES GORDON BENNETT has given an order to the Herrshoffs, of Bristol, R. I., to build him a yacht which they must guarantee shall be faster than the Vigilant. The boat is to be constructed of Tobin bronze.

IRON AND STEEL PRODUCTION.

The investigations of the Census and Geological bureaus evidence that in 1870 there were only 3,000,000 gross tons of iron ore produced in the United States; in 1880 there were 7,000,000 tons produced; in 1890 it had reached the enormous amount of 16,000,000 tons, and yet it is said that the iron deposits have scarcely been touched. It has increased fivefold in twenty years, or the production in 1870 was less than one-fifth the production in 1890. In 1880 the United States produced 3,835,000 gross tons of iron ore, against 7,749,000 tons produced in Great Britain.

The increase in the production of pig iron has been

NEWS AROUND THE LAKES.

CHICAGO, ILL.

Special Correspondence to The Marine Record.

The old Range light-house at the North pier, which has done excellent service for very many years, helping to guide the mariner into this port, will soon be one of the things of the past, as it is being torn down.

Capt. D. M. Cochrane has again brought out his excursion steamers John Dix and R. J. Gordon. They have been put in first-rate condition for their season's work. They will run from Clark street bridge.

The schooner John Raber which left here light Saturday night for Traverse City, sprung a bad leak and was compelled to run back to this port, arriving Monday morning. She has gone into dry dock for repairs.

At Miller Bro.'s shipyard the steamer Manitow was in dock and received new buckets on her wheel, the schooner yacht Idler for cleaning and painting bottom, the tug Rosaline for repairs to stern bearing, the tug Mollie Spencer for a new wheel, the schooner John Raber to have leaks stopped, the steam yacht Catherine C was recalced and painted.

The schooner Charlotte Raab, Capt. J. W. Melchert, which dragged her anchors and collided with the government breakwater at 1 a. m. of June 6th in a heavy gale from the northeast, has received several new frames and stanchions, some new plank, stringers and rail and recalcing at a cost of about \$500. She is ready to go into service again.

P. H. Fleming & Co., chartered the steamer Chauncey Hurlbut and barge Clint for corn to Buffalo at 1 3/4 cts. Capt. John Prindiville chartered the steamer D. M. Wilson for 56,000 bushels of oats, and barge Manitowoc for 40,000 bushels of oats to Buffalo at 1 1/4 cents. He has also this week sold the schooner Sunrise for the Hibernian Bank to W. T. Farwell, Chicago, consideration, \$6,000.

The whaleback passenger steamer Christopher Columbus, Capt. Robert Smith, arrived here Friday morning from Duluth. Capt. Alex McDougal and several of his friends were on board. The Columbus commenced running excursions Saturday. She has received considerable internal alterations and improvements since she was here last season running to the World's Fair.

The yacht race of the Columbian Yacht Club took place Saturday between Chicago and Michigan City. The three winning yachts were the sloops Hattie B, first prize, a brass cannon; Allie T, second prize, a 10-inch compass; Hattie Bradwell, third prize, a marine glass. The Hattie Bradwell was the first to arrive at Michigan City, but had to concede time allowances to the Hattie B and Allie T.

Capt. J. P. Clark, of the schooner Surprise wishes to enter his protest against the captain of the Sheboygan, Wis. Life Saving Station. He states that through stress of weather he was compelled to bring the schooner to anchor off Sheboygan south point, Thursday, May 17th, and rode out the gale until Monday, May 22d. He displayed a signal of distress on the schooner but received no assistance from the life saving station, which was less than a mile distant, and the wind blowing fair for the lifeboat to run before it.

Capt. C. H. Sinclair returned Sunday from Duncan City, where he left the remains of the steamer Waldo Avery. He reports her hull is burned so badly that it may be considered a total loss. Her machinery and boiler are in fair condition, considering it having gone through the fire. The steamer Roanoke accomplished the work of wrecking her and towed her to Mackinaw City, where the balance of her load of corn was taken out. The tug Dana towed her to Duncan City, where she now lays alongside the dock full of water.

The strike by the Vessel Owners' and Masters' Association for an increase of freights for the lumber fleet is bearing good fruits. Many schooners have received the one shilling raise in freights asked for and the majority of the schooners now in port will not accept charters for any less freights. The freight rates established by the Association are eleven shillings for pine lumber from Menominee and all points north of that port, and the same from Frankfort, Mich., thirteen shillings for hemlock lumber from Pine Lake, fifteen shillings for hardwood lumber; eight cents apiece for hemlock ties, six and one-half cents apiece for cedar ties, one and three-quarter cents apiece for cedar posts. Same rates to Lake Huron points.

WILLIAMS.

DULUTH, MINN.

Special Correspondence to The Marine Record.

The steamer St. Magnus from Montreal to Duluth with a cargo of general merchandise, went ashore near the Baptism River club house, 60 miles down the north shore, Wednesday morning. Her master, Capt. Moore, laid his trouble to defective compasses. They were steaming along at a lively jog through the thick fog, and the first intimation of trouble was the boat's gliding

on the beach until almost wholly out of water. She was pulled off and put into the Barge Co's dry dock little the worse for the experience. Capt. Moore was the master of the Algoma when that vessel was lost nine years ago at Isle Royal. The north shore has apparent attractions for Canadian vessels, as it was only about a year since the Rosedale went ashore at Knife river.

The Pennsylvania & Ohio Fuel Co. is beginning work on an extension to its dock 300 feet long. This makes three different large coal dock jobs now under way at the head of the lakes, and another to come later.

But few contracts for carrying coal have been made yet, but it is now probable that as soon as the mines are started, a number of carrying contracts will be closed. The Vesselmen are looking for higher rates, but the coal companies are not willing to pay any more than the present rate. The rate offered is from 35 to 40 cents a ton. Vesselmen think that before the season is over the rate will go to 75 cents per ton, but the coal companies have but little fear of this and soft coal contracts at 35 cents have been made.

Iron ore shipments from this region have been delayed materially the past week because of the coal strike and are likely to be light for a week or two longer. If coal mines from which the upper lakes draw their supply are all in operation on Tuesday morning, as now seems probable, it will be not over a week before there will be an abundant supply at all coaling stations and the trade will go on rapidly. But no sooner is one trouble settled than another comes up, and now the Gogebic miners are making a disturbance.

The Duluth-Superior Bridge Co., which has the charter for a new bridge between Rices & Connors points, at the mouth of the upper harbor, has negotiated its bonds and will build at once, it is said. The bridge will be for all traffic, but is owned by street railway interests.

It is a matter of not a little regret to local people that Capt. Inman has decided to restrict the use of his tugs. Ever since the captain has been in business in Duluth he has freely given his friends the privileges of his tugs for rides about the harbor. This he is now to suspend, because it has grown to be a nuisance and is causing him trouble.

The North West is carrying good passenger lists, and they promise to increase rapidly. Anchor and Western Transit line men say their passenger traffic is not so greatly affected as might be expected, because the new greyhound is increasing the lake business and taking people by water who had previously gone all rail. The other boats will also of course, have all the travel to intermediate ports, such as Marquette, the copper country and Chequamegon Bay.

BAY CITY, MICH.

Special Correspondence to The Marine Record.

The rebuild of the steamer City of Cleveland at James Davidson's Bay City Dry Dock has been completed, and the steamer is now waiting orders, when she will clear for a loading port. It will be remembered that the City of Cleveland went ashore on the Beavers, Lake Michigan, last fall, and as the result of this experience she was badly damaged, and twisted two ways. She now looks like a new boat, and is much stronger, and better than ever before. All of the twist has been taken out of her, and she is now in first class shape, and in perfect order.

The repairs consisted of putting in entire new upper deck beams, and making them much heavier than before, putting in entire new stanchions and bulwarks, about half new between deck beams, taking out center board and box entirely, and filling up the space occupied by same, taking off the bottom planking about one third of the way, and replacing same new, putting in new stern post, new keel and forefoot, new keel and garboard strakes aft, heavy solid bulkheads were placed in the lower hole forward and aft, and these were edgebolted, and diagonally braced, and well kneed off, the bulwarks were made solid, inside and outside, and she was given entire new rails, and her stern is practically entirely new. A steel cord 15x1 was put entirely around the boat on the inside, and another steel cord 15x1 was put entirely around her on the outside, and she was refastened from the keel to the rail, has new decks and was recalced from keel to rail including both decks. Her hatches were arranged more convenient for loading, and they are now all 24 foot centers, and she can be loaded with seven chutes at one time, she has all new hatch comings, and hatch covers, besides being given a convenient fueling hatch, so that her fuel can be placed below decks in her bunkers in 15 minutes. A new deck house was built amidships, which makes fine quarters for the deck hands and firemen, and a large lamp room as well.

The new bulwarks and upper works has changed and improved the boat's appearance, and being newly painted all over, as she lay at the dock, she had every appearance of being a new steamer. M. A. Bradley of

Cleveland, O., is the owner of the City of Cleveland, and Capt. M. Mulholland, of the steamer Geo. Stone, who has been looking after the repairs, will shortly leave to resume his former command.

The steamer Monohansett has taken the place of the City of Cleveland at the Bay City Dry Dock, to make repairs to her forefoot to which damages were sustained by striking some rocks in the St. Lawrence river. After the Monohansett comes out of the Dry Dock the schooner Lizzie A. Law will go into the dock for a general rebuild. There are 200 men steadily employed at the Bay City Dry Dock.

The tug Giant, lying at Frank P. Young's coal dock, sunk on Tuesday and came near drowning the fireman, Daniel Lawrence, of West Bay City, who was asleep in the pilot house. He fortunately awoke and found the tug going down. He then crawled through the door and struggled to free himself, and in so doing struck a pane of glass, which cut his right foot so badly that nine stitches were required. He managed to free himself and get to the surface of the water. He stood upon the pilot house of the tug, which was awash, until assistance came to him. He says he shut the seacock the night before and does not know what made the boat sink.

BUFFALO, N. Y.

Special Correspondence to The Marine Record.

Capt. Henry, of the Lehigh Transportation Co., interviewed this week, relative to fuel on his line, is reported as saying: "We have been using anthracite for the past two weeks for our fleet of 11 steamers. Just what the difference is relatively in the cost of anthracite and bituminous coal we are hardly in a position as yet to say. My impression is that we will use about 20 per cent less of the hard coal owing to its greater staying qualities as compared with the soft coal. Against that has to be placed the increased cost of 30 to 40 per cent. Then, again, anthracite takes up less room and we are thus enabled to carry more freight. It is also less severe on the boilers. We have not had to make any furnace alterations. In our steel ships are shaking grates, differing from the fixed grates of wooden craft. In time we hope to be able to work it so that the cost in using anthracite will not be much greater than the cost of bituminous coal. To do that will require a little experience on the part of the firemen. We used to consume from 5,000 to 6,000 tons of bituminous coal a month."

Capt. John Mitchell, the well-known Cleveland vessel owner and broker, visited our port on Monday, presumably on vessel business, but I found Capt. Mitchell so reticent that he would not part with an item of news. He was rallied about the recent report that he had been laid up with the whooping cough, or scarlet fever, or as some would have it, both troubles at once.

The following communication is self-explanatory:
H. G. Trout, Buffalo, N. Y.:

I have this day received bill and shipping bill of the steamer Volga's propeller wheel. The wheels are doing good work, the Volga's speed being increased two miles per hour by the use of your wheel.

Yours respectfully,
JOHN H. JOHNSTON.

CLEVELAND, O.

The strike of miners in the Gogebic ore section is making ore charters almost an impossible transaction and little is being done in the freight market.

Capt. McQueen, late of the S. S. Curry, has been appointed master of the Marina, of the Minnesota Steamship Co., vice Capt. Andrew Graves, resigned.

Fueling is now getting quite easy at this port and lots of coal is at hand, although on inquiry it is found that most of it is ordered or appropriated by special owners.

Moore & Bartow bought in the propeller Fairbank at Buffalo this week for \$10,510. Her valuation in Inland Lloyds for insurance purposes is placed at \$35,000.

The River Machine & Boiler Works are keeping very busy on new and repair work. Mr. Teare admits however that less work and better collections would be more preferable.

Capt. Benham and Capt. Dan McLeod surveyed the wooden steamer Escanaba this week in the Cleveland dry dock, and inclusive repairs will be made on her so that she will be practically as good as new both in hull and machinery when she starts out again.

The Globe shipyard is now pushing along the construction of the new steel steamer, sister ship to the North West. The large freight steamer building on their own account is also progressing towards completion and an early launch is now talked of.

Capt. Rattray, master of the steamer Specular owned by the Republic Iron Co., burned slabs on her last down trip. From those on board I learned that it was awful hard firing to keep her, or rather the furnaces, going with this easy consuming fuel and they want no more of it.

The Mariposa has been surveyed by J. R. Oldham after her bottom damage in the Soo River. Mr. Dalton, manager of the Minnesota Steamship Co., believes in letting each trip meet its own responsibilities and the Mariposa will be placed as good as when she was launched.

Capt. Andrew Graves has retired from the Minnesota Line and will now give his attention to improving his farm and real estate around Geneva, O. The captain is well fixed financially and is entitled to retirement, though we might prognosticate that he will be sailing again before long. In the Minnesota Line, his son, Capt. Fred is still to the fore and his brother Carlton is also one of the best known steam-boat masters on the lakes.

On the arrival of the steamer North West here Monday a survey was held to learn what damage had been done by her running into the dock at Detroit. It was found that several frames were bent and broken and one or two shell plates would have to be taken off. The accident occurred in going alongside of the dock owing to the starboard engine not reversing when the signal was rung up. The damage to the North West, the wharf at Detroit and the steamer Mackinac is comparatively slight and will be settled by Mr. Robert Logan who is now in Detroit looking after the interests of the Northern Line. A new throttle valve was put aboard of the North West here and she left again within an hour.

Bids were opened this week for the construction of the hull of a fireboat. The specifications called for proposals for either a steel or a wood hull, and the following were the figures of the bids: The Union Dry Dock Co. of Buffalo, steel, \$12,450, wood, \$11,657; Murphy & Miller of Cleveland, wood \$9,375; Cleveland Ship Building Co., steel, \$16,250; Cleveland Dry Dock Co., wood, 10,700; Globe Ship Building Co. of Cleveland, steel, \$15,624. It is remarkable that the Globe and Cleveland figured so close, there being only about \$600 difference in their computations. Experts are now saying that Mr. Gaskin, Superintendent of the Union Dry Dock Co. has got away down below actual cost, however, he will probably build the boat and make wages at least out of the business.

Capt. Swartwood took his steamer, the J. H. Wade, up through the Hay Lake channel after the North West, and when asked here whether he considered the new channel a failure, which was the opinion sent out from Buffalo last week, replied: "Not by any means. I had a pilot on the way up, but would not need one again. As for the narrow parts, they are not so narrow as some places in the old channel, and the course is so straight that it is easy to take a boat up through it," Capt. Swartwood suggested, however, that the boats bound up should pass through one channel, and those coming down through the other. "I saved considerable time," he continued, "by taking the Hay Lake channel. It usually requires two hours and forty minutes for the Wade to go through the old channel, but I went through Hay Lake channel in one hour and thirty-seven minutes." Several of the vessel captains speak in high praise of the new channel, and it will no doubt come into general use as soon as it is turned over to the government at the end of this month.

There is a movement on foot to have the original volunteer life saving crew of Cleveland take part in the Fourth of July procession, riding in the old lifeboat, in which they did their work. This boat is still kept in the boathouse of the station and is used as a surfboat in all the lighter work. She is still in good condition although of an old type of build, the buoyancy being maintained by airtight hose running around outside of the gunwale. The volunteer crew was organized in 1876, when Capt. Samuel Law was appointed keeper. There were eight oarsmen, a coxswain and the captain. The oarsmen were Walter Metcalf, now a well known diver, his brother Charles Metcalf, Lewis Kist, who was later connected with the regularly mustered crew for some years, and Fred Kalmbach, Charles McArthur, William H. Rogers, Charles Jenks and John Jennings. The Chamber of Commerce should see to it that the boat is properly mounted and equipped in the procession. Chaplain Jones is going to have a representation of the soul saving floating bethel and the two mounts would make an excellent allegory.

DETROIT, MICH.

John Oades is building a large ice barge at his shipyard here to the order of the Belle Isle Ice Co.

Wherle of Sankusky is intending to build a small passenger steamer and the Detroit Dry Dock Co., will probably secure the contract.

The steamer City of Mackinac has been surveyed in dry dock, but they have not yet made an estimate of the amount of the damage done by the North West. A force of carpenters and other workmen were set to work to make the repairs and a large part of the woodwork above the steel hull is already removed. The damage

extends quite a distance back from the stem, several timbers being sprung and some of them being carried away. Mr. Logan represents the owners of the North West in settling all damages to wharf and Mackinac.

LIEUT. BLOW TALKS.

Lieutenant George P. Blow, of the United States Navy was the guest of the Cleveland Chamber of Commerce on Tuesday. He has charge of the government Hydrographic Office at Chicago and had accepted an invitation to explain its workings to the Cleveland business men. In the course of his address Lieutenant Blow said: "The Hydrographic Office is not only what its name implies, the branch of the government charged with the duty of charting, and surveying navigable waters. It is the friend of the sailor. In addition to the making of charts, we publish sailing directions. On the sea coast we have 5,000 voluntary observers. We are required by law to charge a nominal price for our books—the price of the paper and printing. Our reports are looked up to by all the world. It is the United States office only that has the co-operation of the merchant sailors, other countries relying entirely upon their navies. Our charts show the exports and imports, light-houses, sailing and steamship routes and much other information. Branch offices have been established in twelve cities. The policy of the office is co-operative. Captains make their reports to the office and the information, after being checked and corrected, is at once made public. For some time the Navy department has taken a deep interest in the great lakes. Officers have been up investigating the facilities for construction. Steps were also taken to ascertain how quickly torpedoes could be transported across the country by rail. The Chicago branch office was established last year first as an exhibit at the Columbian Exposition. Later it became a permanent fixture. The work of the Hydrographic Office upon the Great Lakes must be necessarily different in some respects from that on the sea coast, where its reputation is so well established and its methods so well known and appreciated. In the first place the conditions are different, and the representatives of the Hydrographic Office have much to learn from their fresh water brothers. Here piloting takes the place of navigation, and the lead the place of the chronometer and sextant. As a pilot the lake shipmaster has few equals and no superior. As navigators, as the term is understood on salt water, want of necessity and practice place him at a disadvantage. At present a knowledge of this kind of navigation is entirely unnecessary, but the time will come—and at no very distant day—when deep water connection with salt water will be established, and the lake steamer will clear for all foreign markets of the world. Then the value of the Hydrographic Office will be increased a hundred fold to the lake captain.

"There is one point, however, where the fresh and salt water sailor must join hands, for it belongs equally to piloting and to navigation. I refer to compass. Together we must fight our natural enemy, that tendency of the magnetic needle to point anywhere but true north. The rapid evolution of the high speed, twin screw, deep draft, steel steamers such as the North West and Virginia, and the immense cargoes of magnetic ore and machinery carried by lake vessels, makes it a question of vital importance. It is difficult if not impossible to forecast exactly the measures of the hydrographic system on the great inland seas, as we have much to learn as to the real needs and requirements of its people. The prime object of the office, however, is to be of use to ship masters and ship owners, and we will always gratefully and act on any suggestion tending to promote this general object. Soon after the Chicago office was established, attention was called to the necessity for a magnetic variation chart. The office at once started work on this chart, and not only issued a variation chart, but also published a set of azimuth tables to be used in connection with it, for the determination of the compass error and local deviations. The pilot chart of the Great Lakes has met with hearty commendation from all sides. At present, owing to lack of funds, it is impossible to publish it as a monthly periodical, as the pilot chart of the Atlantic and proposed pilot chart of the North Pacific are. It is hoped, however, that two or more issues may be made for each season of navigation. The most recent information, which would otherwise appear on this chart, is now issued in the notice to mariners for the Great Lakes, which is published on the 15th of each month. Next year it is intended, if the appropriation is sufficient to issue this notice each week as is done for the regular notice to mariners. These notices to mariners are made up from reports received from the United States Light-House Board, Corps of Engineers, United States army, reports of the United States Life Saving Stations, United States Weather Bureau, newspapers, the Department of Marine and Fisheries of Canada, re-

ports of shipmasters, and the reports from the Branch Hydrographic Offices. They are intended to supplement the pilot charts of the Great Lakes and the new sailing directions of the different lakes, now in course of preparation. These notices to mariners are mailed free to each vessel navigating the lakes, and it is hoped that ship masters will see their value, and assist in the good work by reporting such information as they think will be of interest or value to others. By consulting Notice to Mariners No. 2 it will be seen that the Hydrographic Office has already issued thirty-six charts of the St. Lawrence river and Great Lakes, besides the pilot chart of the Great Lakes and the azimuth tables. A complete set of sailing directions is already nearly completed and will be issued in a short time.

"The Hydrographic Office realizes the immense area covered by the lakes and the necessity for additional branch offices. Through the energy of your secretary one of these—the Cleveland Branch Hydrographic Office—is about to be established under the most favorable auspices. I congratulate the Chamber of Commerce and the city of Cleveland, for I feel assured that no such location could have been found on the Great Lakes, and I firmly believe that this office will grow in importance until it becomes an absolute necessity to all the shipping interests of the Eastern lake system. It is hoped that a similar office may be established in Duluth, that the West may have the same advantages as the center and East, and that the work of distributing gratuitous information in the shape of publications, and of collecting data, may be simplified and improved.

"Preparations for the establishment of the Cleveland Branch Hydrographic Office have all been made, so that in case the appropriation passes on July 1, the work of installation will begin. The charts, books, and office equipment has been selected and packed—the three special pieces of furniture have been built and are ready for delivery. The rest of the furniture, carpets, etc., will be purchased in Cleveland as soon as the new appropriation is available. It gives me great pleasure to inform you that I will have the hope to install and open this office, which I assure you, as far as furniture and equipment is concerned, will rank at the head of Branch Hydrographic Offices."

Capt. C. E. Benham suggested that the charting of the currents on the lakes would be of more importance than the means provided for the correction of compasses. He expressed confidence that many lake masters could very successfully navigate in salt water. Furthermore that vesselmen would heartily co-operate with the work of the Hydrographic Office.

ITEMS FROM THE LOG BOOK.

A. A. Schantz, general passenger agent of the Detroit and Cleveland Steam Navigation Co., is making a business tour of Ohio and Indiana cities.

The burned and sunken steambarge W. P. Thew, at Bay City, has been examined by Capt. C. E. Benham, and pronounced practically a total loss. She was insured for \$8,000.

The Pennsylvania and Ohio Coal Co., is going to make a large addition to its dock at West Duluth. The addition will be 300 feet long. It will be left uncovered and will be used for soft coal.

The American Line have arranged with Messrs Cramp, Philadelphia, that their new Atlantic steamer St. Louis will be launched on the 4th of July, the anniversary of declaration of Independence, while the St. Paul will be launched two months later.

According to recent statistics the Russian mercantile marine at present consists of 429 steamers and 4,001 sailing vessels in the Arctic, Baltic, Caspian, and Black Seas; while on the rivers and lakes there are 1,804 steamers and 20,095 other craft.

The steamer Mariposa, which struck an obstruction in the Sault a few days ago, arrived with her ore cargo on Monday afternoon, and when unloaded will probably go into dry-dock for examination. J. R. Oldham will represent the owners on the survey.

Cleveland has made wonderful strides as a passenger port within the last two years. In 1892 there was only one daily line running to Detroit carrying passengers, in addition to which were the Lake Superior line boats, arriving and leaving in each direction about three times a week, a weekly boat to the Straits, and traffic between Cleveland and Chicago on Canadian boats. Now there is a daily line to Buffalo, one to Ashtabula and Fairport, O., and one to Rond Eau, Canada, besides a tri-weekly line to Port Stanley, Ont., another to Lorain, O., a weekly line to Duluth, Minn., and a largely increased excursion business.

The Hawaiian ship John Ena has recently cleared from Port Gamble, Wash., bound for Australia, with the largest cargo of lumber ever shipped on a vessel from any port in the world. She carried 2,625,767 feet. The John Ena is a steel ship built at Port Glasgow, Scotland; her four masts and all her yards are also of that material. She was built especially for a lumber carrier and is flat bottomed, which gives her an advantage over other large vessels, as she only draws 21 feet 6 inches when fully loaded. She is 312 feet long, 48 feet beam and 25 depth of hold. Her tonnage is 2,842. She is fitted with steam deck winches for hoisting sails and anchors, and by this means only has to carry a crew of sixteen men and three mates.

LEARMAN'S "VOLUNTEER" LIFE PRESERVER.

(ILLUSTRATED.)

A helmet made of oilskin and air tubes having a mask attached to the best make of cork life belts is the latest invention for preserving life during immersion. This device is brought forward by George W. Learman, Cleveland, O.

The "Volunteer" life preserver is designed for use by veterans in the service as well as those less certain of their ability to survive the buffeting of water either when attempting a rescue or in endeavoring to reach shore after a vessel has stranded.

The assumption is granted that persons are lost through being buffeted and swallowing large doses of water rather than through the lack of initial stability of life belts, or their power to otherwise care for themselves during immersion. Equipped with the "Volunteer" outfit the tests made at Cleveland, O., and Buffalo, N. Y., show that no matter how broken the water the respiration is easy and perfect, the mask is of light weight and the wearer is protected from all of the annoyances of spray continually dashing around him and which, without the protection given by the mask, would eventually suffocate, or render unable to keep up the struggle for life even an expert swimmer.

From the tests it would appear that the new device was especially adapted for use on the lakes or where broken water had not the weight and volume found on many rock bound coasts. The wearer of the "Volunteer" finds increased confidence after immersion when he learns that the water does not effect or impair his respiration. At the same time he experiences the firm buoyancy of the solid cork which will not permit a wearer to go under.

The inventor points out that any member of the crew if stranded on a lee shore could don the helmet and have a hundred chances in his favor of reaching shore, over that which he would have without the outfit, he further asserts that when being compelled to take to the rigging in hard weather, or when adrift upon a raft, or living in an open boat, the appliance would be found of incalculable benefit to the wearer; also that a person unable to swim would find comparative security for a limited time when dressed in his outfit.

In connection with the helmet air tubes and life belt, or cork jacket, the inventor has devised a combination suit covering the entire body like a diver's outfit, only of a light, durable material rendered waterproof. In very cold weather this will prevent the extremities from being chilled through and give the wearers a still greater chance of surviving any exposure or hardships which they may be called upon to undergo.

Life saving appliances of every description command the best attention of those "who go down to the sea" and the ingenious yet thoroughly practicable "life saver" herewith illustrated will no doubt meet with the earnest consideration of those whose duty it is to ameliorate the condition of seamen as well as those interested in life saving devices solely from a humanitarian standpoint.

BLOOD IS THICKER THAN WATER.

Referring to the recent dinner given to Admiral Irwin and Capt. Mahan and the officers of the United States ship Chicago by the Lords of the Admiralty in London, on Thursday, May 31st, it is noted by the cable despatches that the most prominent feature on that occasion was the motto, "Blood is thicker than water."

There are very few people, either in England or America, who know just the origin of that expression. The writer is in possession of the facts of the case, and as all true Americans are proud of their country, it would seem, in these days of commemoration of the soldiers and sailors, from general down to landsman, that it would be a propos to refer to the subject.

The facts of the case are these: In 1859 the English government had some trouble with Chinese on account of their smuggling opium, which resulted in a conflict of arms. Fortunately the United States government happened to have a few ships in the East Indian squadron at that time, and while the old side-wheel steamer Powhattan could not go up the Pelho river, there were some transports chartered, and Flag Officer Josiah Tatnall raised his flag on one of these boats and stood up the river, more to look on than anything else. Tatnall suddenly discovered that the English Admiral's

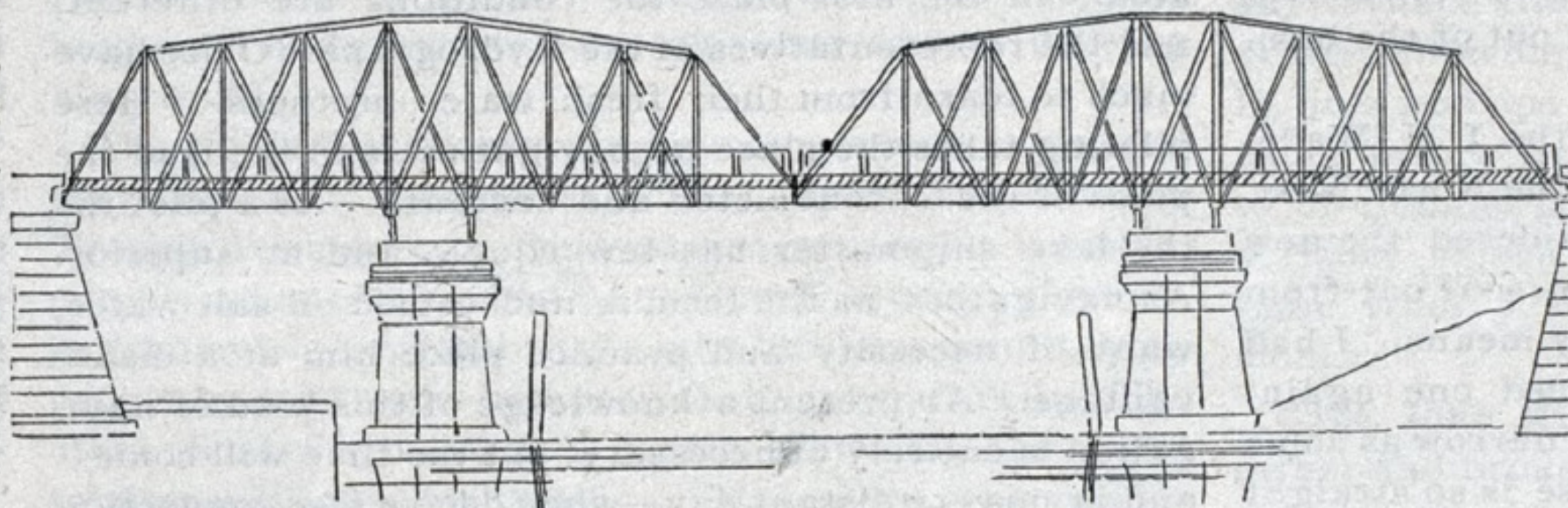
ship was aground and the Chinese, taking advantage of the situation, were raking her fore and aft. This was more than Capt. Tatnall, as he was then called, could stand, and he ordered the First Lieutenant of his ship (the Capt. being under the weather) to stand up toward the English Admiral's ship and get out a hawser, when the First Lieutenant turned to the Captain and said: "That is against all international law." The old man said emphatically, "D—n the international law, blood is thicker than water. Don't you see they are raking him fore and aft?" And that is the origin of the expression.

The American ships at that time in the East India squadron stood by the Englishmen, took off their wounded and were ready to render any assistance that might be required. But to the credit of the English officers may it be said, that while they appreciated the efforts of the Americans, they did not for a moment ask for assistance. It is a pleasure for an American to hear at this late date that these facts are recognized by the largest maritime power in the world, and we, as Americans, are willing to shake hands with them on the subject, but it must not be forgotten that the expression originated with a thoroughbred American, whose name is a tradition in our service, and that the only surviving officer of the occasion in question is now a very successful Philadelphia merchant, and one too which THE MARINE RECORD desires to bear testimony to, as being of the right sort of metal, no less a person than Mr. Clarke Merchant, senior member of the well-known babbitt and anti-friction metal firm of Merchant & Co. of the city of brotherly love.

BRIDGE DESIGNING.

(ILLUSTRATED.)

We illustrated last week the new lift bridge at S. Halsted street, Chicago, which was designed especially to overcome the evil of placing large abutments in the middle of the river, thus obstructing commerce. Cleve-



COLUMBUS STREET BRIDGE, CLEVELAND.

land comes next to the front with a new design for Columbus street bridge crossing the Cuyahoga.

As will be seen by reference to the illustration, the project is actually a double bridge in one, each bridge having a span of 134 feet supported on strongly built turntables and operated by electricity.

This special construction will give a widened and improved channel of 115 feet, besides furnishing a roadway twenty feet wide and a sidewalk six feet broad on either side.

ONE FEATURE OF THE WORLD'S FAIR.

Since the fair closed, remarks an exchange, the electric launches used at the World's Fair have been sought after, not only in this country, but in various parts of Europe. One is now running on the canals of Venice, another is in use in Germany; another is owned by Lord Aberdeen, and is now running on Rideau river, Ottawa; one has been purchased by Cornelius Vanderbilt for use at Newport; nine were purchased by the park commissioners at Chicago, and may now be seen in daily use there; some were purchased by Mr. Plant, and were in use all winter at Tampa Bay; two have been secured by A. Meinecke, Jr., of Milwaukee; one has been secured by the Hartman General Electric Co., Duluth, Minn.; another is in use at Salem, Ill., the property of Dr. Wellman, and so on.

ASTRONOMY.

The moon's phases for the month are: New on the 3d, first quarter on the 10th, full the 17th, and last quarter the 25th. At the 4th it was in perigee, and on the 19th in apogee. Venus, rising a little before 3 o'clock in the morning, and being therefore, in the twilight of the sun, and Mars, rising between midnight and 1 o'clock are morning stars. Jupiter, whose time of rising is about 4:30 a. m., may be seen in the morning twilight. Mercury and Saturn are evening stars. As to the peculiar illumination of the sky before sunrise and after sunset, which appropriately has been called twilight, let it be remarked here that it begins before the rising of the sun, when the latter is 18 degrees below the horizon, and ends after sunset, when the sun is as many degrees below it. At any time the twilight is shortest at the equa-

tor, and then at the time when the sun is at the equinoxes; that is, on the equator. It lasts then one hour 12 minutes. At the poles twilight lasts for several months, thus diminishing the darkness of the long winter months. In our own latitude the shortest duration of twilight is about an hour and a half. Twilight is produced by the reflexion of the sunlight from the air and clouds, which are still illumined after the sun has sunk below the horizon or before it rises above it. Were there no atmosphere darkness would at once succeed the setting of the sun and would prevail until the very moment of sunrise.

The planet Venus is in the constellation of Pisces, the last of the 12 constellations of the zodiac. Mars is in Aquarius and Jupiter is still in Taurus, while Saturn is embellishing the constellation Virgo. Before we give a description of the aspect which the June skies will present it may be permitted to us to make a few concluding remarks on the subject of time. We have mentioned and defined the different kinds of the day and the year which the astronomer distinguishes, and now it remains to say something about the month and week. The period called month depends altogether upon the motion of the moon about the earth. The longest of the different kinds of month is the lunar or synodic month, whose length is equal to 29 degrees, 12 hours, 44 minutes, three seconds. It is the time elapsing between two consecutive full or new moons, and consequently designates the period after which the moon assumes the same position relatively to the earth and sun. The tropical month denotes the time of the equinoxes, which, as mentioned repeatedly before, leave a retrograde motion. The tropical month extends over a space of 27 degrees, 7 hours, 43 minutes, five seconds. The sidereal month is the interval between two successive conjunctions of the moon with the same fixed star, and is about seven seconds longer than the tropical month. Besides these three the reader may sometimes notice two more, the anomalous and the nodal months, the former being the interval between two consecutive returns of the moon to

its perigee or its apogee, the latter marking the time in which it makes a revolution with reference to the points of intersection of its orbit with the ecliptic, which are called nodes. The calendar month is simply an artificial division of the year into 12 periods. The week has nothing whatever to do with the movements of the heavenly bodies. Their names were derived by the ancients from the sun, moon, Mars, Mercury, Jupiter, Venus, and Saturn, the only members of the solar system then known.

AMPLITUDES.

The following approximate amplitudes of the Sun's rising will be given each week in this column during the season of navigation: A second bearing of the Sun may be taken at sunset by reversing the bearings to read west instead of east, as, for example, N. E. by E. for a sunrise bearing would read N. W. by W. for a sunset, or E. 30° N. to W. 30° N.

LAKE ERIE AND S. END LAKE MICHIGAN. LAT. 42° N.
Sunrise. App. Time Amplitude. Bearing (points).
June 24 Rise, 4 h. 30 m. NE. by E. 1/8 E.
June 28 Set, 7 h. 30 m. NE. by E. 1/8 E.

LAKE ONT., S. END HURON AND CENTER LAKE MICHIGAN. LAT. 44° N.

Sunrise. App. Time Amplitude. Bearing (points).
June 24 Rise, 4 h. 23 m. NE. by E. 1/8 E.
June 28 Set, 7 h. 37 m. NE. by E. 1/8 E.

N. END LAKES HURON AND MICH. LAT. 46° N.
Sunrise. App. Time Amplitude. Bearing (points).
June 24 Rise, 4 h. 16 m. NE. by E.
June 28 Set, 7 h. 44 m. NE. by E.

LAKE SUPERIOR. LAT. 48° N.
Sunrise. App. Time Amplitudes. Bearing (points).
June 24 Rise, 4 h. 7 m. NE. 1/8 E.
June 28 Set, 7 h. 53 m. NE. 1/8 E.

With a compass correct magnetic, the difference between the observed and true bearing will be the variation for the locality. If there is any deviation on the course the vessel is heading at the time of taking the bearing the result after the variation is applied will be the amount of deviation on that course.

A party of vessel men congregated recently in the office of the Milwaukee Tug Boat Co., and conversation turned upon the hard blow of May 18, when so many schooners were lost on Lake Michigan. A question concerning the schooner Myrtle brought out the reply: "Why, she was built at Milan, O., in 1857, and what is singular her keel was laid on a Friday, she was launched on a Friday; she started upon her maiden trip on a Friday, and now after thirty-seven years' service and a career more or less eventful but which seems not to, have involved above the average amount of misfortune, she has passed out of existence with all on board on a Friday."

MARITIME LAW.

THE STATE OF VIRGINIA IN RE STATE STEAMSHIP CO.

District Court E. D. New York. April 13, 1894.

SHIPPING—LIMITATION OF LIABILITY—Where the British owner of a British ship is proceeded against in an American court by both British and American cargo owners in respect to a loss of cargo occurring in British waters, the extent of his liability is determined by the statutes of the United States and not those of Great Britain.

This was a petition for a limitation of liability for loss of cargo by the steamship State of Virginia, filed by the State Steamship Co.

Benedict, District Judge. In July, 1879, the steamship State of Virginia, owned by the State Steamship Co. and bound for a voyage from New York to Glasgow, with a cargo, stranded on Sable island. Her cargo sustained damage for which suits were commenced by certain English underwriters and by certain American underwriters against the owners in personam, in this court. Thereafter, and before the suits came on for trial, this petition for limitation of liability was filed by the State Steamship Co., and an order was made to appraise the value of the steamship State of Virginia and her pending freight on the voyage and the interest of petitioner in the same. The petitioner is a corporation organized under the laws of Great Britain. The steamship State of Virginia was a British vessel. The proofs taken before the commissioner show that the vessel became a wreck and that the cost of her attempted rescue was greater than the sum realized from the property saved. The commissioner accordingly reported that the steamer and her freight, after the disaster and stranding aforesaid, were of no value. To this finding exception has been taken, in order to raise the question whether the British owner of a British ship, being proceeded against in an American court by both British and American cargo owners, in respect to a loss of cargo occurring in British waters, can claim the limitation of liability provided by the statutes of the United States, or whether the limitation of this liability is to be determined by the law of Great Britain, there being a statute of Great Britain whereby the liability of a shipowner is limited to eight pounds per ton of gross registered tonnage. No objection being taken to the method adopted for presenting this question for the decision of the court upon this question, I have given it due consideration, and my opinion is that the extent of the liability of the shipowner, in a case like this, is determined by the statutes of the United States and not by the statutes of Great Britain. The exceptions are therefore overruled.

BERGH et al v. CEBALLOS.

Circuit Court of Appeals, Second Circuit. April 19, 1894.

1. **SHIPPING—LOSS OF CARGO—LIABILITY OF SHIP AND CHARTERER.** A ship chartered so that the charterer is deemed to be the special owner is nevertheless not freed from liability on his contracts of affreightment; and a decree for loss by negligence may be made directly against the ship, and need not provide that collection shall first be made from the charterer, and only the deficiency, if any, from the ship.

2. **SAME—FINAL DECREE—APPEAL—PRACTICE.** A ship was libeled for loss of freight shipped under contract with her charterer. The owners filed a petition, alleging that the charterer was alone responsible for the loss. The charterer answered both the libel and petition, and, after hearing, the court entered a decree for the full amount against the ship, but, as the question of responsibility as between owners and charterer had not been cleared up by the evidence, retained the cause as between them for further proceedings. Held, that the decree was final and appealable as between libelants and the ship, and the appellate court could properly affirm the same, and allow the remainder of the cause to proceed in the district court as there determined.

LAUNCH OF THE UNIQUE.

The McElroy flyer Unique was successfully launched on Saturday afternoon in the St. Clair river. Her appearance in the water is fine and she is expected to be the fastest on fresh water. Most of her machinery is ready to be placed. Her boilers will be put in at Port Huron and it is expected that she will be running on or before August 1.

The steamer Unique is calculated to make twenty-five miles an hour. She will run between Detroit and Port Huron, making two trips each day. Her model is something of a departure from the regular type, and her builders feel confident she will show remarkable speed. The Unique is 175 feet long and 26 feet beam. Her lines are as perfect as any boat that ever was set afloat and her entire build is a great credit to Alex Anderson, the builder.

Her wheel is of solid brass with a ten and a half foot lead. She will be fitted with quadruple expansion engines, built by the Frontier Iron Works of Detroit. The four cylinders will be 15, 22½, 30 and 42 inches in diameter. The boilers, made in West Virginia are of the well known Ward type, and are similar to those

used by the United States navy. It is expected the Unique will be completed in about two weeks.

Alex. Anderson is a pioneer in shipbuilding, having been engaged in that business for the past thirty years. Among the largest boats he has built are the schooners Alex. Anderson and Pewabic and steamers P. J. Ralph, Newaygo, F. W. Fletcher, Wotam and Unique.

Hon. C. McElroy, the designer and principal owner of the Unique made the model himself. Although not a naval architect, he has advanced some great ideas as regards boats built for speed. He was also the first to discover the vast salt deposit along the St. Clair river. He was designer and principal owner of the fast steamer Mary, which has been in commission on the St. Clair river for the past twenty years. Associated with him as owners are Frank McElroy, his son, and Judge J. B. Moore, of Lapeer.

KEEPER OF THE CLEVELAND L. S. STATION.

Capt. Charles H. Motley the recently appointed keeper of the U. S. Life Saving Station at Cleveland, is a man in the prime of life and one whose career eminently fits him for the station he now occupies. He was born in Norwalk, O., and early took to lakefaring as an occupation. For fourteen years Capt. Motley was in the employ of S. H. Davis, fish dealers, Detroit, and also with Averill & Co., Cleveland. His life saving experience and knowledge of the rules of the service was gained at Thunder Bay and Middle Island Stations on Lake Huron, and it is only necessary to add that honors have been nobly fought for and gained at both of those stations.



CAPT. C. H. MOTLEY.

The Cleveland Station, as well as several more on the lakes, are to have new boats as well as other increased facilities for carrying on their work, and it is safe to say that no casualty to shipping will take place within the Cleveland district without all that men and materials can do to aid or rescue the distressed.

NEW TONNAGE.

Official numbers were assigned by the Bureau of Navigation to the following lake built craft during the week ended June 9, 1894. Steam—Fabian, 72 tons Buffalo; H. P. Bigelow, 47 tons, Oswego; Leslie, 38 tons, Chicago; Pleasure, 873 tons, Detroit, Posalie B., 19 tons, Detroit.

NEW STEAMBOAT LINE.

A movement is on foot among a number of capitalists living in Lewiston, Rochester, Oswego and Watertown for the running of a fleet of steamers next year from Lewiston to Ogdensburg. The leaders in the new enterprise are the Hon. H. F. Inglehardt, of Watertown, proprietor of a number of hotels among the Thousand Islands; B. B. Taggart, of Watertown, president of the Alexandria Bay Steamboat Co., and a Mr. McGowan, of Oswego. The new company will have a capital stock of about \$35,000, to be divided into shares of \$100 each. The scheme was first thought of last fall after the summer business had ended, but, owing to the financial depression and the lateness of the season, no success was had with the movement, only \$24,000 of the required capital being subscribed. It was then decided by the promoters of the enterprise to hold the matter in abeyance until the opening of the present season. After the company has been formed, it is the intention to have a fleet of boats constructed, excelled by none

that traverse the lakes, being similar in many respects to the steamers of the Cleveland & Detroit Steamboat Co. Regular trips will be made from Lewiston and stops will be made at Charlotte, Oswego, Clayton and the principal islands to Ogdensburg. The owners of the steamer Bon Voyage, which has been run in previous seasons between lake and river ports, are seeking a sister boat for her. If they succeed in getting the right kind of a boat before the season is too far advanced, it is their intention to make regular trips between Charlotte and the Islands for excursions and outing parties.

STOPPING A LEAK.

The Anchor Line steamship Ethiopia, which sailed from New York on June 2, collided with an iceberg in the Atlantic and stove in her bow at and above the water line. The Ethiopia struck the iceberg on the afternoon of the 6th, while she was steaming ahead in a dense fog. The shock was frightful. Everybody that was standing at the moment of impact were thrown to the deck. At first the officers feared that the vessel would not float, and the captain ordered the boats to be lowered. The excited passengers crowded up to the deck, most of the women weeping and the men asking the usual questions. The pumps were lowered just after the captain ordered down the boats, but no water was found in the hold. The order for the boats was then countermanded and something like confidence was restored among the passengers. Soon the fog lifted. As there was little sea the crew were able to work to advantage in making temporary repairs. The broken spars of the yacht Vigilant were laid across the injured part of the bow, and behind them was built a wall of bags of flour up near the bow. When the flour had become thoroughly saturated it was almost as hard and unyielding as cement. The crew worked for two days shifting the cargo aft so as to lift the broken part of the bow above the water. The Ethiopia, which had been stopped for repairs, was put ahead after the worst damaged portion of her bow had been partially closed and braced. At first she went at quarter speed, then at three-quarters, and, after passing Tory Island, in the North channel, at full speed. Nobody aboard the Ethiopia was injured, and the cargo was not greatly damaged. Vessel men who have seen the Ethiopia's bow marvel that she was kept afloat after the collision. That the vessel was saved they think was due to the stability of her bulkheads and the intelligent management of the captain. The passengers were so pleased with the untiring and successful efforts of the crew that they subscribed \$270 for the sailors.

SCIENCE AND PROGRESS.

That the "old astronomy" is not by any means a fixed science is demonstrated by the discovery, as recent as 1889, that the geographical position of the pole on the earth's surface is not fixed, but "wabbles." In the June *Cosmopolitan*, C. A. Young describes this peculiar phenomenon as "an actual traveling of the pole over the ground, and is due to a slight change of the position of the axis within the globe itself."

Such a shifting of the pole naturally changes the latitude of any given place, and that this was a fact was first demonstrated in Germany about five years ago. All recent latitude determinations of precision confirm this fact, and the latest results of Chandler based upon several thousand observations made at seventeen different observatories between 1840 and 1893, combined with still older observations taken at Greenwich, show that this motion is unexpectedly regular. Mr. Young describes this motion as being "made up of two supposed revolutions of the pole from west to east, one with a period of just a year, in a circle of about thirty feet in diameter, and the other in a circle of similar size, but with a period of 428 days. As a consequence of this combination of motions, the actual annual displacement varies greatly. Once in about seven years the two practically destroy each other, and the pole remains for a time nearly stationary (as in 1885), while at intermediate epochs (as in 1890) it describes a sort of circle fully sixty feet in diameter." Such a slight degree of motion requires observations of marvelous precision to detect; but its discovery has explained many anomalies and apparent errors in former work.

The cause of this "wobble" is not clear as yet, but is probably due, in part at least, to the annual deposit of snow and ice upon the northern continents.

SECRETARY CARLISLE has issued an order announcing that "the authority to nominate persons for appointment as keepers and assistant keepers of lights in the light-house service was taken from Collectors of Customs June 6, 1894, by order of the Secretary and transferred to the inspectors of the several light-house districts." Captain Evans, Naval Secretary of the Light-House Board, says that this action "absolutely takes the light-house service out of politics."

THE MARINE RECORD

ESTABLISHED 1878.

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SPEAKING of the intelligence and the zeal which Eugene T. Chamberlin, the new Commissioner of Navigation, is devoting to the work of the Federal Bureau of Navigation. The *New York Journal of Commerce* says: "Commissioner Chamberlin appears to appreciate the fact that his office affords opportunities for the collection of statistics that really throw light on the disputed questions of shipping legislation, and are of vital interest and value at a time when the attention of the business men of the nation is turned to the development of foreign markets and new features of export trade." These commendatory words are thoroughly merited. Evidently Mr. Chamberlin believes in disseminating official information as it comes to hand, instead of storing it away for a year among the archives of his office for use only in the annual report.

RELATIVE to the re-imposition of export duty on Canadian timber the senate committee on finance has just issued from the government printing office a bulletin covering the replies received to its inquiries of lumber manufacturers. Accompanying these replies are some interesting data relative to the Michigan holdings of Canadian timber. It is therein stated that: "The imposition of export duties on lumber were first imposed in 1866 upon logs and shingle bolts, and were continued, variations as to amount, until 1890, when under the statutory offer of the McKinley bill, a reduction of the duty was made to \$1, and the reimposition of the Canadian export duty would be most disastrous to this extensive American industry. The sawmills of the Saginaw Valley and other points in eastern Michigan, are now almost entirely dependent upon the forests of Canada for a supply of logs. The importation of logs from Canada for Michigan, Ohio, and western New York mills was not less than \$5,000,000 in 1893.

LOCAL TAXATION OF FLOATING PROPERTY.

There is a local measure of taxation of floating property which requires all the influence of owners to abrogate. We refer to local or state taxation of vessel property. A bill was recently introduced in the California senate, which received the sanction and support of California shipping men in regard to this matter, the principles of which are that steamers and vessels owned entirely within the state shall not, for purposes of taxation, be included in the personal estate of things to be taxed; but that the net yearly income of such vessels shall be taxed to the owners there or in their places of insurance, according to the several interests therein and that the net earnings shall constitute the valuation upon which the vessel shall be taxed. Within the last few years some of the states have adopted laws similar to the above and movements are, or were on foot, both in Ohio and Illinois with this end in view. The known ignorance of assessors of personal property regarding the value of shipping property leads them into many unjust and grievous modes of rating vessels for taxation, one of which is the custom of referring to insurance registers for their figures, which, as a rule are made approximately, simply for the purpose of insurance, and represent the utmost limit for which a vessel may be insured.

It can be seen that by this method of taxation the ship owner is mulcted of much of the profit his investment gives him, while his property is deteriorating all the time. The theory has been advanced that every man in a community must contribute his quota in dollars and cents to pay for the protection and support the local government gives him, and that his vessel property, if he has any, should not be exempt from paying its share. This should be operative only when local authorities give that protection to vessel property that they do the man or his landed property. The vessel comes under the protection

of the national government only and she may never even once enter the port in which her owner resides. What does this ship owe to local authorities? But they protect the property of her owners, it will be said, and indirectly protect the vessel. Well, if that is the case, then let only that amount of the earnings of the vessel which the owner recovers within the jurisdiction of the local government be taxed. As the general government protects and fosters shipping, so also does it tax that shipping. The net earning only, and not the value of the vessel, should be assessed for local taxation.

THE APPRENTICE SYSTEM.

Now that our inland marine is assuming gigantic proportions, under the able management of a qualified and experienced class of men, we think the time has arrived when a regularly organized system of apprentices would tend to increase the efficiency and elevate the standing of the future service. It may be ordinarily understood that the craft or skill of seamanship does not require a thorough and special training; but the contrary is the fact, and the youth enjoying the advantages of special training would be more competent at the expiration of a few years than one who was allowed to gather his knowledge say, as he could pick it up. A respectable, intelligent youth joining a vessel with the understanding that he had embraced sailing as a distinct profession, would, no doubt, yearn to become a proficient in the work and craft of seamanship, and it would be the duty of his employers to see that the lad had opportunities given him to learn how to handle a vessel. Under the head of the causes of collision alone may be mentioned the seemingly permanent neglect or misapprehension of the steering and sailing rules, bad lookout, foggy and thick weather, errors of judgment, neglecting to show lights, parting cables, dragging anchors, want of seamanship, anchoring in foul berth, and various other causes which the apprentice would require to be taught for the preservation of his employer's property. The youth so appointed by any of our large ship-owning firms would enjoy singularly fortunate advantages; for while the season of navigation, including the fitting out and laying up of their vessels, would probably occupy eight months of the twelve, the other four months could be profitably spent in acquiring a theoretical knowledge of his profession by attending a progressive series of studies at a navigation academy, where he might learn chart exercises, the use and adjustments of the sextant, and other measures, work amplitudes, and azimuths, compute the variation and be conversant with the laws of deviation, the theory of the law of storms, nautical astronomy, and other kindred subjects, besides learning what probably would be considered more practical, a knowledge of invoices, charter party, bottomry, and the various features that constitute a maritime lien. Even allowing that it would take four years' study for the apprentice, he would be a valuable servant to the shipowner, besides having fulfilled the ordinary duties of one of the crew during that period. In this way apprentices might serve their time, become officers, and take command under the same firm, their length of service assuring the owner of their capabilities and desire to earn a reputation in the employ they were trained in. "General education," said a distinguished professor, "should aim at causing a man to form an intelligent opinion with regard to the ordinary affairs of life, and be full of resources for meeting new emergencies."

Technical education should aim at enabling him to understand the process and the machinery of the special work in which he is engaged. Indeed, a thorough education, together with a special training for some particular employment, is becoming more necessary every year, and this we hold is equally true afloat as well as ashore. The rapid and increasing growth of steam navigation calls for an entirely different class of men to what were employed on the sailing craft only a few years ago, and to meet this requirement a class of intelligent young men, who had served several seasons in the steamers, would naturally be, if not the most competent, at least excellent material to qualify under proper instructions and guidance for the more responsible positions on board a vessel, while competency in their profession can not be attained except through the first few years of comparative drudgery and hardship, yet this trying period might be made lighter and less irksome if the apprentices had the knowledge that in a few years they would, by a strict attention to their owners' interests and their own skill and conduct, be qualified to command a steamer themselves.

In the first annual report of the commissioner of navigation, in 1884, we find that a system of apprenticeship is recommended to be established in pursuance of which American merchant vessels engaged in the foreign trade might receive a certain fixed sum from the government for the support and instruction of apprentices carried on board for a stated term of years. Such a system would, it is thought, do much to improve the average standard of American seamen and repay the national outlay in affording an available corps of seafaring men who could

be relied upon in case of emergency to help man the navy. Yet, notwithstanding the most favorable reports from the shipping commissioners at the various large coast ports and the strong recommendations from our foreign consuls, no farther steps have been taken in this important matter, and it would seem as if private enterprise would be obliged to take the initiative in organizing the system of marine apprenticeship, which, if once established, would soon become a popular mode among those desiring to obtain a command; hence, we would earnestly urge the owners of the large established lines to enter upon an apprenticeship system, bring up their own officers and masters, resting assured that as the sailor is always loyal to his flag, so also would these lads be found, zealous and trusty servants to the ship, to the master he sailed under, and to the owner.

WAVES OF SOUND.

Of all the climatic discomforts to which dwellers in temperate maritime regions are subjected there are few so irksome or which cause such destruction to life and property as a fog. The opacity of a fog to light is in itself a fruitful source of evil, rendering, as it does, locomotion by land or sea alike dangerous. The dangers at sea have been materially augmented by false notions as to the transmission of sound waves in a fog.

Until a few years ago it was a generally received opinion that fog deadened sound. This idea was so deeply rooted in the popular mind that many writers on acoustics accepted the belief as a fact and invented theories to account for a phenomenon which did not exist.

Humboldt was the first to cast a doubt upon this theory by discovering that a non-homogeneous atmosphere was unfavorable to the transmission of sound; but it was left for Professor Tyndall to show conclusively that fog, instead of retaining sound, really transmits the waves of sound with greater freedom than an atmosphere which, though optically clear, may yet be, so far as its acoustic properties are concerned, turbid or flocculent. Fog is merely the visible result of the partial condensation of the aqueous vapor present in the atmosphere, and this act of condensation removes the chief barrier to the transmission of sounds, viz.: aqueous vapor, which often occurs in the air in the form of invisible streaks or curtains, which break the continuity of the sound, or, in other words, deaden it. These acoustic clouds may occur on days of optical clearness, and have been known to retard the progress of sound to such an extent as to render unheard at a distance of three or four miles the reports of some forty or fifty field pieces continually fired during an engagement in the Franco-Prussian war. The puffs of smoke announcing the discharge of the guns could be distinctly seen, but not a sound reached the observers. On the other hand, the firing at Waterloo was heard at Dover, and a well authenticated instance is on record of the discharge of a gun during a dense fog being audible some forty-four miles away.

Upon the water the fog retains all its pristine purity, and its gray, uniform mantle forms the mariner's greatest peril. When nearing the shore or another vessel, the sailor has nothing to guide him but his sense of hearing. We have shown above that fog does not retard the transmission of sound, but there is one effect it has upon sound waves which is almost worse. When a sound wave produced in a fog strikes the ear it is often almost impossible to locate the source of the sound with any degree of accuracy. The whole surrounding air seems resonant with the sound, making the direction of the source of the sound mere matter of surmise. This was strikingly illustrated during some experiments conducted by the United States Light-House Board. While at sea during a dense fog the steam whistle of a ship was distinctly heard. The investigators attempted in vain to localize the sound, differing by four points in their endeavors to fix the position of the neighboring vessel. Error of judgment in such cases or miscalculation of the distance of the fog signal, be it steam whistle, horn, fog siren or gun, may be fraught with the most disastrous consequences.

GREAT CIRCLE SAILING.

It is now universally known by seamen that the shortest line which can be drawn between any two places on the surface of the globe is an arc of a great circle passing through them both; and, moreover, that the rhumb line, or the apparent course upon the chart drawn from one of those places to the other, can never coincide with that great circle unless both places lie on the equator or on a common meridian. It is not, therefore, from want of a general conviction of the propriety of having recourse to great circle sailing that it is so rarely used by practical men, but from the tedious length of the calculations requisite to determine the series of ever-changing courses which a vessel must pursue in order to adhere to the track of a great circle.

Every great circle divides the surface of a sphere in two equal parts, and is called a great circle because it is the largest that can be drawn on the sphere, its radius

being that of the sphere itself; and, since each great circle divides the sphere into two equal parts or hemispheres, it must also divide any other great circle into two equal parts or semi-circles. The shortest distance between any two places on the earth's surface is on a great circle; consequently, that ship alone which sails along the arc of a great circle sails directly for her port. Mercator and parallel sailings conduct the ship by a circuitous route when compared with the track of a great circle, but the simplicity of the calculations connected with those sailings, and the circumstance that by them the ship makes but one course throughout the voyage, have led to their being preferred to great circle sailing, in which the course is continually changing. To determine, by calculation, how much the course must be changed from time to time, has been a problem so tedious and so often to be repeated as to preclude its being generally adopted.

It is, however, a very satisfactory indication of the growing attention to the science of navigation that in many recent voyages the sound principle of conducting a ship along the arc of a great circle has been adopted; and not only in those cases where a large amount of distance may be obviously saved, but in the more every-day work of selecting the most advantageous tack on which to lay the vessel with a foul wind.

THE bulletin of recent changes in aids to navigation, issued by the Light-House Board, shows perhaps the largest number of changes on the lakes during the past month ever yet recorded. Each departure must, of course, be considered an improvement on the past, but we are sorry to see that it has been necessary to make upwards of a score of corrections on the original or former "Notices to Mariners," now so widely printed. As soon as possible after each notice is issued by the Light-House Board at Washington, the daily papers invariably reprint same for the benefit of their readers engaged in active sailing, and while most of the corrections given in the June bulletin are minor ones, others are glaringly at fault. For instance, in giving bearings from Gravelly Island shoal buoy, we were told that Poverty Island buoy bore NE. $\frac{1}{2}$ E; this is now corrected to read E. $\frac{3}{8}$ N. Another bearing is given as SW. $\frac{3}{8}$ S. instead of W. $\frac{3}{8}$ S., while in the case of a light station on the Pacific coast the opposite point to the bearing has been given and only now stands corrected. Under the former secretary of the Board a group of "Notices to Mariners" were found incorrect previous to their publication in, THE RECORD and leave was given to correct them although the daily papers had printed the inaccurate notices a day or two before. There surely is no cause for the Light-House Board to send out inaccurate bearings; better not send out any at all than be compelled to make a score of corrections every now and again. How, we might ask, would it do to detail three or four more naval officers to verify the angles and bearings and read proof before circulating such lubberly untruths? The fractional parts of a point which the Board still delights in are an abomination, we thus desire to say, but perhaps the word is somewhat too strong. However, such a department as the Light-House Board has an excellent leverage in assisting to a proper rendering of bearings, and these should always be expressed in degrees from the polar points, although we are free to admit that fractional parts of points instead of degrees has hitherto been in more general use on the lakes than elsewhere. It is nevertheless the clear duty of a government department to assist in making the right prevail and promulgating to the extent of its ability an almost universal and only correct system.

LAKE FREIGHTS.

The Chicago grain freights to Buffalo slumped away down this week to the 1 cent rate on corn though there is now a somewhat firmer feeling with a quotation of 1½ cents.

Ore rates at Cleveland hold for the head of the lakes at the old figures, viz., 80 cents, although a drop of 10 cents was made on a few charters, Marquette and Escanaba, charters have been placed at five cents lower than former quotations though the market is again strong and owners are holding for at least the old rates. Duluth has also felt the stringency and chartering is at low ebb. Tonnage is being turned away daily. The nominal rate for wheat is 2¼ cents per bushel to Buffalo, and 3½ to Kingston. A line boat took wheat at 1½ cents for Buffalo on Wednesday. There has been throughout the week no demand whatever for tonnage to carry wheat. This has thrown a surplus of tonnage on the ore market and as a consequence the rate on ore dropped. There was very little movement throughout the week in lumber and rates are weak at \$1.75 per thousand. Lake and rail rates on flour mill products have kept steady on a basis of 17½ cents 100 pounds to New York.

With the comparative settlement of the coal miners strike it was expected that business would brighten up, but now comes along the iron miners strike in the Lake

Superior region and this will have the effect of weakening the freight market in future charters, and suspending shipments. Already over two thousand men are out and others are dissatisfied, so that the strike is expected to spread.

VISIBLE SUPPLY OF GRAIN.

The stock of grain in Chicago elevators last Saturday evening were 19,280,000 bushels of wheat, 2,894,000 bushels of corn, 107,000 bushels of oats, and 126,000 bushels of rye. Total, 22,421,000 bushels of all kinds of grain, against 22,194,000 bushels a year ago. For the same date the secretary of the Chicago Board of Trade states the visible supply of grain in the United States and Canada as 57,105,000 bushels of wheat, 7,073,000 bushels of corn, 2,529,000 bushels of rye, and 85,000 bushels of barley. These figures are smaller than the corresponding ones a week ago by 1,106,000 in wheat and 441,000 in corn. The visible supply of wheat for the corresponding week a year ago decreased 2,287,000 bushels.

NOTICE TO MARINERS.

UNITED STATES OF AMERICA—NORTHERN LAKES AND RIVERS—MICHIGAN.

PORT AUSTIN REEF LIGHT STATION—Notice is hereby given that on or about June 30, 1894, the steam siren now used during thick or foggy weather at Port Austin Reef light-station, in Lake Huron, 1½ miles from the mainland, off the entrance to Saginaw Bay, Michigan, will be discontinued, and thereafter the fog signal will be a 10-inch steam whistle, sounding blasts of 7 seconds duration separated by silent intervals of 80 seconds, thus:

Blast	Silent interval	Blast	Silent interval
7 sec.	80 sec.	7 sec.	80 sec.

OBITUARY.

CAPT. SMITH MOORE.

On Friday afternoon last Capt. Smith Moore reached Marquette, Mich., after a week's business trip to Cleveland. He boarded a street car, and while talking with some friends in the car he fell suddenly backward, his face flushed and he showed every symptom of apoplexy. Medical aid was summoned, but in a few minutes the captain was dead. The body was taken from the car to the morgue, where it was embalmed and prepared for burial.

Smith Moore was born in Vermont, but spent the greater portion of his life in Cleveland. He early adopted sailing as his vocation and, at the time of his retirement, three years ago, was one of the best known captains of the entire lakes. In early life, after he had commanded lake vessels for a while, he took charge of an ocean going vessel plying between New York and the Isthmus of Panama. About twenty-three years ago he returned to Cleveland and became captain of the steam barge H. B. Tuttle. It was in command of this boat—the first steam vessel to carry iron ore from Marquette—that Capt. Moore first visited the port from which he was so untimely called hence. He last commanded the James Pickands.

About ten or twelve years ago Capt. Moore acquired some property at Marquette, and a few years ago he settled there. His property kept growing, and he sought local political honors, being elected alderman, his death leaving the term unexpired by nearly a year. He was about sixty-five years of age and leaves a grown-up family. Capt. Moore was a member of the Masonic order and the burial was under its auspices.

HYDROGRAPHIC WORK ON THE LAKES.

The Hydrographic Office of the Bureau of Navigation, Navy Department, desires to connect itself with the nautical practice of the Great Lakes in the manner which has obtained for many years between the office and the mariners of the oceans of the world. In pursuance of its object, it will place within the reach of the mariners of the Great Lakes much useful nautical information that cannot be profitably collected and published by private individuals. Some of its publications are circulated among mariners without charge, but in the nature of an exchange, it being presumed that mariners will co-operate with the office in collecting information for the general benefit. For other publications the office is required by law to make a charge, which, however, amounts to only the cost of printing and paper, the cost of the surveys and of the various drafting and engraving processes and the work of compilation not being included. In general, notices to mariners and hydrographic bulletins are issued without charge. Pilot charts are given without charge to those who co-operate actively with the office in securing information which is embraced upon the chart. For hydrographic charts and for sailing directions and special book publications the office makes a small

charge. For special information in answer to inquiries no charge is made. Publications that are issued without charge may be obtained from the Branch Hydrographic Office at Chicago; those for which a charge is made may be obtained from the agents of the office, namely, Messrs. Rand, McNally & Co., 166-168 Adams street, Chicago; THE MARINE RECORD, Messrs. Smith & Swainson, 144 Superior street, Cleveland, O., also from Geo. C. Seaman, at Sault Ste. Marie, Mich. Agencies will shortly be established in other cities on the lakes.

The charts, sailing directions, notices to mariners, pilot charts and hydrographic bulletins published by the Hydrographic Office have been of great value to mariners on oceans all over the world. These publications have enabled mariners to shorten their passages, avoid the dangers to navigation, handle their vessels with greater facility and avail themselves of favoring conditions. Much loss of life and property has been avoided by means of the information thus furnished.

The monthly notices to mariners will, together with the pilot charts of the Great Lakes, serve as supplements to the book of sailing directions for the Great Lake regions.

This notice to mariners is compiled in the Hydrographic Office at Washington from reports from the Branch Hydrographic Office at Chicago, Ill.; publications of the U. S. Light-House Board, the Corps of Engineers of the U. S. Army, the reports of the U. S. life saving stations, the U. S. Weather Bureau, the notices to mariners by the Department of Marine and Fisheries of Canada, newspapers and the reports of private individuals voluntarily co-operating with the office in this mutually beneficial work.

These notices to mariners will be issued gratuitously and the co-operation of all mariners is earnestly invited in order that reliable and useful information may be published promptly for the benefit of all concerned.

Mariners and others interested in lake navigation who desire to voluntarily co-operate in this work are invited to visit the Branch Hydrographic Office at 1621 Masonic Temple, Chicago, Ill., where they can have their barometers, thermometers and other instruments compared with standards. They will find there the latest information relating to the navigation of the Great Lakes, weather conditions, reports of ice, reports of currents, recent chart corrections, etc.

Information can be sent either to the Branch Hydrographic Office at Chicago, Ill., or to the Hydrographer, Navy Department, Washington, D. C. Regular co-operating observers will be supplied with envelopes by which reports can be sent by mail from either United States or Canadian ports without postage stamps, and such reports will always be duly acknowledged.

PILOT RULES.

The following circular has been issued by the Treasury, WASHINGTON, D. C. February 28, 1894.

To Masters and Pilots of Steam Vessels:

Your attention is directed to the following resolution of the Board of Supervising Inspectors, approved by the Secretary of the Treasury, regarding the misuse of the whistle signals for steamers passing each other authorized by Pilot Rules, Lakes and Seaboard, also for Western Rivers:

RESOLVED, That pilots of steam vessels be instructed, through the local inspectors of steam vessels when licenses are being issued to such pilots, either originals or renewals, that the signals provided in Pilot Rules, Lakes and Seaboard, and Western Rivers, for steamers meeting, passing or overtaking, are never to be used except when steamers are in sight of each other and the course and position of each can be accurately determined, in the daytime, by a sight of the vessel itself; or at night, by its signal lights.

In fog, mists or falling snow, when vessels can not see each other, fog signals only may lawfully be given, and pilots should, upon hearing the fog signal of another vessel, ahead or on either bow, run slow, with frequent stoppages, until the fog signals of the opposing vessels are heard abaft the beam.

And further resolved, That these resolutions be printed in a foot note on the Pilot Rules when new editions are printed, and also in circular form, to be presented by the local inspectors to each master and pilot, when issuing to him his license.

STILL IN LITIGATION.

In November, 1889, the steamer S. S. Wilhelm towed the lumber loaded barges Midnight and Mears into the breakers on Lake Huron, and after an effort to get into deep water once more cast them adrift, when they stranded and went to pieces, one seaman being lost. The owner of the Mears recently obtained judgment against the Wilhelm for the value of his vessel and her cargo, and now Emory J. Vance, of Bay City, who owned the Midnight, has caused the steamer to be libeled on a claim of \$21,984.42 for his vessel and her cargo, with interest. The Wilhelm has been bonded and her owners, C. E. Eastman and others of East Saginaw, will endeavor to effect a settlement now that the Mears case has gone against them.

SUBMARINE EARTHQUAKES.

"Tidal-waves on the Great Lakes are not of uncommon occurrence," said an old Lake Erie skipper, "and although meteorological experts have for more than a hundred years tried to study out their cause, we don't know any more about it now than we did at the time the great wave rose suddenly on Lake Erie, off Rockport, and destroyed Col. Bradstreet's fleet in October, 1764. That was the first tidal-wave on the lakes that we have any record of.

"I have seen many of these swashes, as we call them on the lakes, the last one about ten years ago, when my schooner was swept high and dry at Port Stanley by a wave that seemed to rise on the lake like some monster marine animal coming from the depths to the surface. We could see it rushing toward us a mile away. It came with a boiling front 10 feet high, hissing like loud-escaping steam as it swept toward us. That is a peculiar thing about lake tidal waves. They do not come with a roar like the ocean surf, but with a loud, hissing sound; and there is only one instance on record where they are accompanied or followed by strong winds.

"That one instance was at Toledo, in December, 1856, when the wind, which had been blowing stiff off-shore, suddenly whirled into a howling nor'easter, and as quick as the change in the wind, that wave leaped out of the lake and came hurling upon the shore a wild and angry mass, eight feet high. In every other recorded occurrence of these mysterious freaks of the lake waters the surface of the lake has been perfectly calm and the air scarcely perceptible.

"Such was the condition when that big wave attacked us at Port Stanley, swamping my schooner and drowning one of my men. The wave receded as fast as it had rushed in, and the lake, in less than 10 minutes was as smooth as a mirror.

"Within the next hour there were four more swashes, each one of less force and volume, until the last was scarcely more than a ripple.

"Almost the first thing I remember, for I was but three years old at the time, was one of these tidal waves. It appeared early in the spring on the Canada shore off Otter Creek. There was a piece of woods there then with a long stretch of beach between it and the lake. My father had a 35-ton schooner lying off the shore half a mile or more. The water was a dead calm, when without warning of any kind a wave lifted itself from the bosom of the lake, probably 1½ miles out, and swept shoreward with its mighty hiss. My mother and I were with father on his schooner. As the swash came rushing upon us it seemed to me as if the leaping foam of its white crest was higher than the schooner's masts, but I know now that they were not more than 12 feet high. The wave was high enough and strong enough, though, to sweep the schooner ashore as if it had been a cockle-shell, and crossed that stretch of beach into the woods, where it was left among the trees, a hopeless wreck.

"In ten minutes the lake was as calm as ever, but an hour later a similar wave appeared at Kettle Creek, 20 miles from Otter Creek, and tumbled all sorts of lake craft ashore.

"I guess the greatest tidal wave ever seen on any of the lakes was the one Dr. Foster and his party of voyagers saw on Lake Superior, between Copper Harbor and Eagle river. That was in August, 1845. This swash was more than 20 feet high, and, like all of its kind, sprung suddenly from the lake at dead calm. It was a quarter of a mile distant from Dr. Foster's boat, which, when the disturbance began, was directly in the path of the wave. It was crested with foam and curled over like a mighty ocean surge. Before reaching the boat, however, the wave turned so that its nearest extremity swept past it at a distance of 50 feet, the water between that extremity and the boat being scarcely ruffled by the influence of the rushing tide.

"The wave was only half a mile from the shore, but, notwithstanding its great size and velocity, it never reached there. The same mysterious caprice that caused it to change its course and pass harmlessly by the vessel seemed to seize it once more, and it sank rapidly from its great height as it approached the shore and struck the beach with no more force or rise of water than might have come from the wash of a passing vessel.

"I remember a notable swash on Lake Michigan, at the mouth of the Menominee. That one appeared in April, 1858, and rushed in the river with such tremendous force and volume that it upset the ferryboat on the Menominee. The recurrent oscillations of these swashes are usually of decreasing size and force, but this one on the Menominee wasn't that kind. The ebb of this tide was just as sudden as its flow, but in a few minutes it was followed by another wave much larger than the first one, and the ebb of the second swash was followed by a wave still larger than the second.

"That seemed to satisfy the mood of the lake at Menominee that day, and, with the receding of the

third wave, calmness, even unwonted, prevailed on its bosom. The time between the coming of the first wave and the receding of the third was less than 20 minutes.

"The curious thing about these lake tidal waves is that they are entirely local in their influence. A swash, even of the greatest force and height, may not effect more than a mile of lake front, the water at either end of them being undisturbed beyond that distance. They always come in from the open water."

BUCYRUS STEAM SHOVELS ON THE CHICAGO DRAINAGE CANAL.

The construction of the great Chicago drainage canal is attracting the attention of the entire country and much interest is being manifested in the work. The steam shovels for excavating have been furnished largely by the Bucyrus Steam Shovel & Dredge Co., of South Milwaukee, Wis., who have now fourteen shovels of their make on the work and are constructing five more for the same purpose, which will be ready within a few weeks. This will make a total of nineteen Bucyrus steam shovels employed.

The Bucyrus company is just now a very busy concern. It recently secured orders from the McArthur Brothers Co., contractors on the canal for two other shovels, one of which will be the largest and most powerful machine of the kind ever built in this or any other country. Four steam shovels of the same magnitude and pattern have also been ordered from the company by Messrs. Griffiths & McDermott. "In addition to these," state the company, "we have a number of other large orders on our books for dredges and steam shovels. We are increasing our force as rapidly as possible and working overtime. We have no reason to feel discontented with the times."

NOTES.

THE Melbourne Steamship Co. (Ltd.) is the name of a new company seeking incorporation, with headquarters at Toronto. They will operate steamboats and barges between Montreal, Duluth and intermediate ports. The applicants are C. A. & J. B. Cantin, G. E. & C. A. Jacques, all of Montreal, and F. Elliott, Denver, Col. Capital stock \$45,000.

THE fast steam launch "So So," formerly the property of the late Norman L. Munro, and now owned by Mr. A. A. Stewart, of New York, arrived at the works of Seabury & Co., at Nyack a few days ago. She has been hauled out and is being fitted with a new patent safety water tube boiler of Seabury's latest design, specially adapted for high duty. Her engines and pumps are also being overhauled, and other work being done to her, so that everything about her will be in perfect shape when the repairs are all completed. She will be used at Shelter Island and vicinity during the summer. This makes the third "Mahogany flyer" that has been fitted with a Seabury boiler within the past month or two. The others being the "Daisy" (formerly the noted Henrietta) and the "Palos," which is a duplicate of the "Daisy."

THE recent discovery of the boilers of the Lady Elgin, which sank in September, 1861, off Winnetka, Ill., with 300 or more people, after a collision with the schooner Augusta, brings out a letter from John Rogerson of Sadorus, Ill., who was a clerk on board of her in 1854, when she ran on Spencer's line between Chicago and Buffalo. She was then owned by A. D. Patchen, of Buffalo, and commanded by Capt. Luther Chamberlain. During the two years she was on that route, he says, she was one of the most popular steamers, and carried a large number of cabin passengers. When she sank she was running on the line between Chicago and Superior City, and was carrying home to Milwaukee an excursion party of some 700 persons. She was then commanded by Capt. Jack Wilson, who was lost from one of the rafts when near the shore.

THE fast exclusive passenger steamship North West is delayed in the Soo from several minutes to several hours every trip, just because the old rule giving passenger boats the right of way has been abrogated. This seems all wrong. The Sault Ste Marie News is of the opinion that freight boats generally would be glad to let the North West go right on through without delay. She is running on schedule time and has her railway connections to make and is the only boat on the lakes devoted to an exclusive passenger business. It would doubtless help her greatly to give her a permit to lock through without delay and a great many are of the opinion that this should be done. The North West is the only exclusive passenger ship on fresh water and belongs to a class of her own. A permit such as is referred to would do no harm. Give her every chance. So says the News, but how about all other passenger boats claiming the same prerogative? All must agree to the exclusive claims of the North West, or none. Certainly we would prefer the former if the privilege could be given solely to the North West.

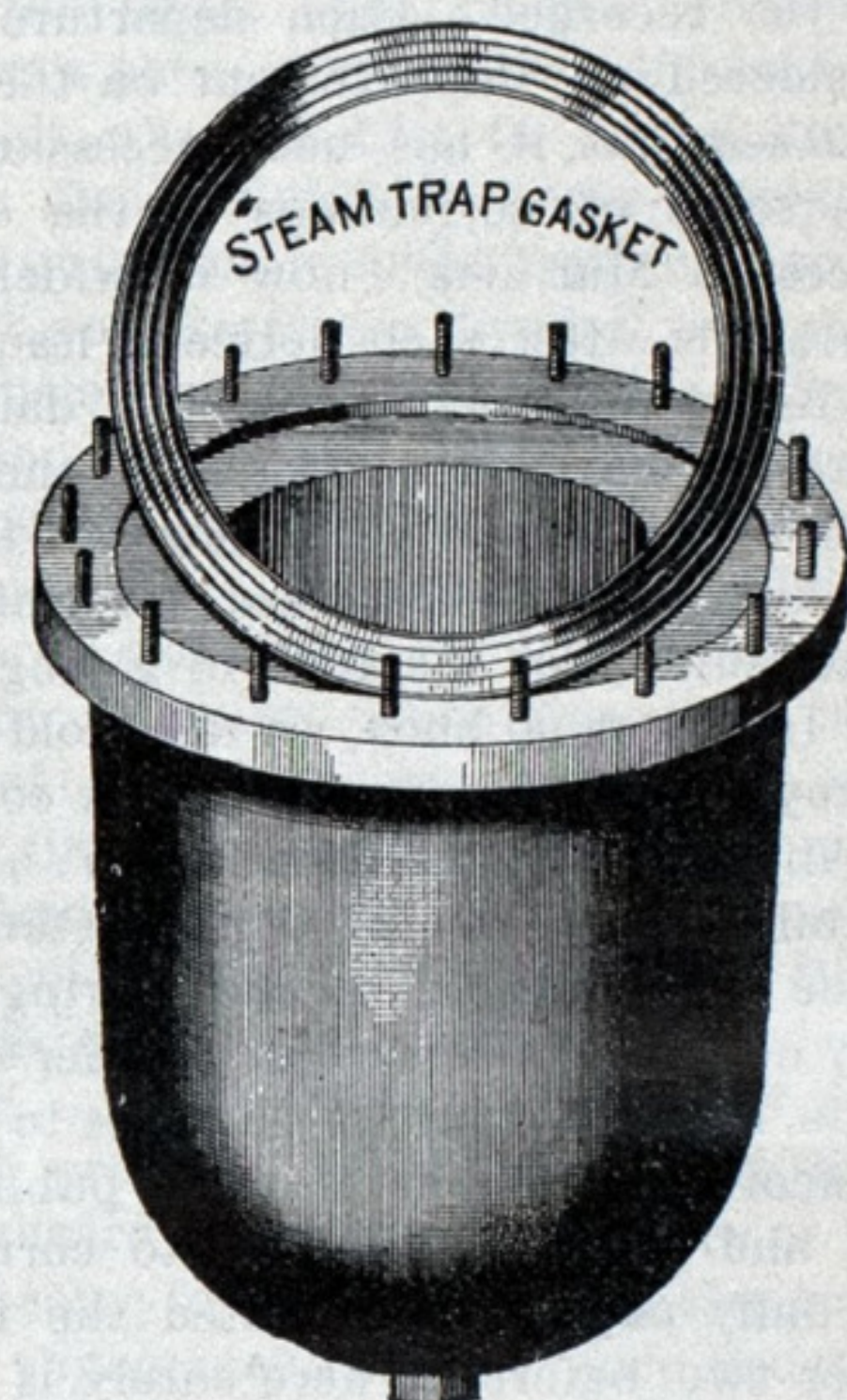
THE GUILLOTT METAL GASKET.

(ILLUSTRATED.)

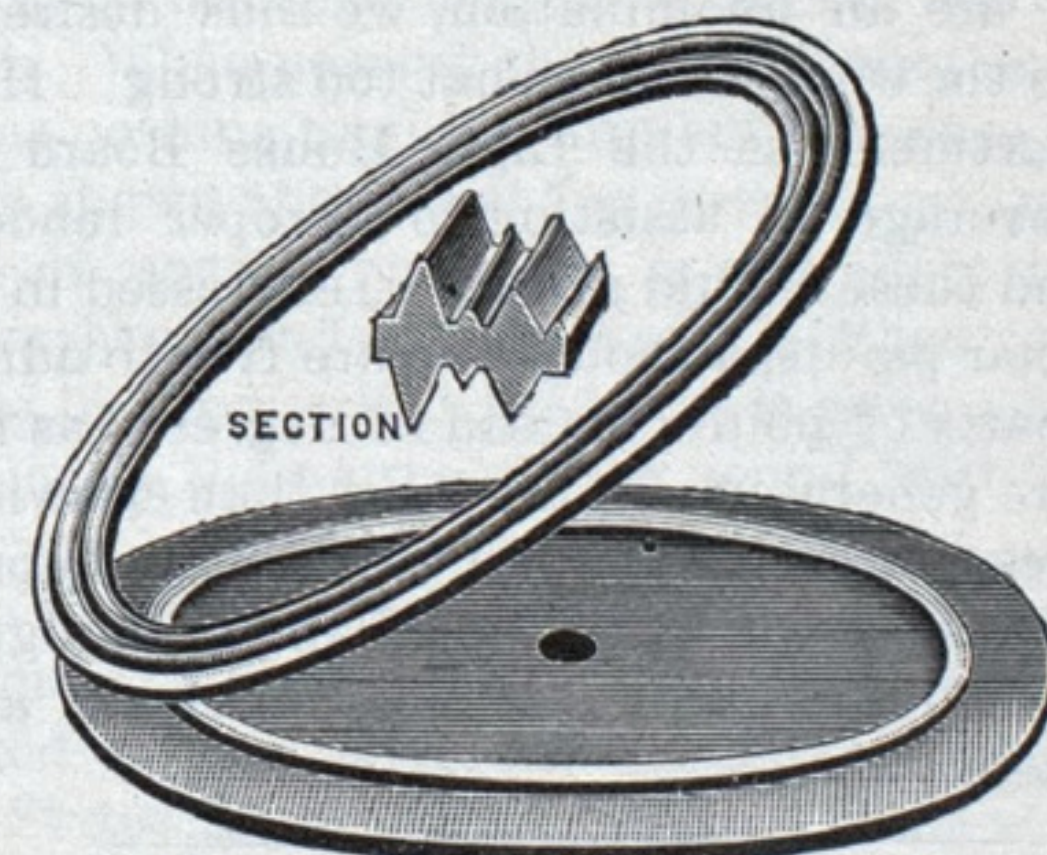
Manhole gaskets are but a small item of expense, or even particular attention in the equipment of the engine room, yet in the face of the claims made by the manufacturers of improved metal gaskets, more direct importance should perhaps be attached to the packing material used.

A recent circumstance which occurred in Chicago river, although liable to take place anywhere or at any time, points out the necessity of using reliable packing for manholes. The case referred to was that of a tug using an inferior rubber gasket. It blew out, scalded the hands of the crew before the fires could be drawn, and entailed an expense or loss of earning ability of over \$50. Had such an accident taken place when the tugs were out engaged in saving life and property during the memorable storm of May 18th last, the result must certainly have been deplorable.

The Guillott Metal Gasket Co., of 32 Milwaukee avenue and 59 N. Clinton street, Chicago, manufacture a metal gasket for which it is claimed that there is no joint, either steam, hot or cold water, ammonia, oil or air, but that a lasting and tight joint can be made with their improved metal gasket. From the literature sent out by the firm we find these metal gaskets have had extensive patronage for stationary and marine uses during the past four years, so that the manufacture is now well worthy of being illustrated.



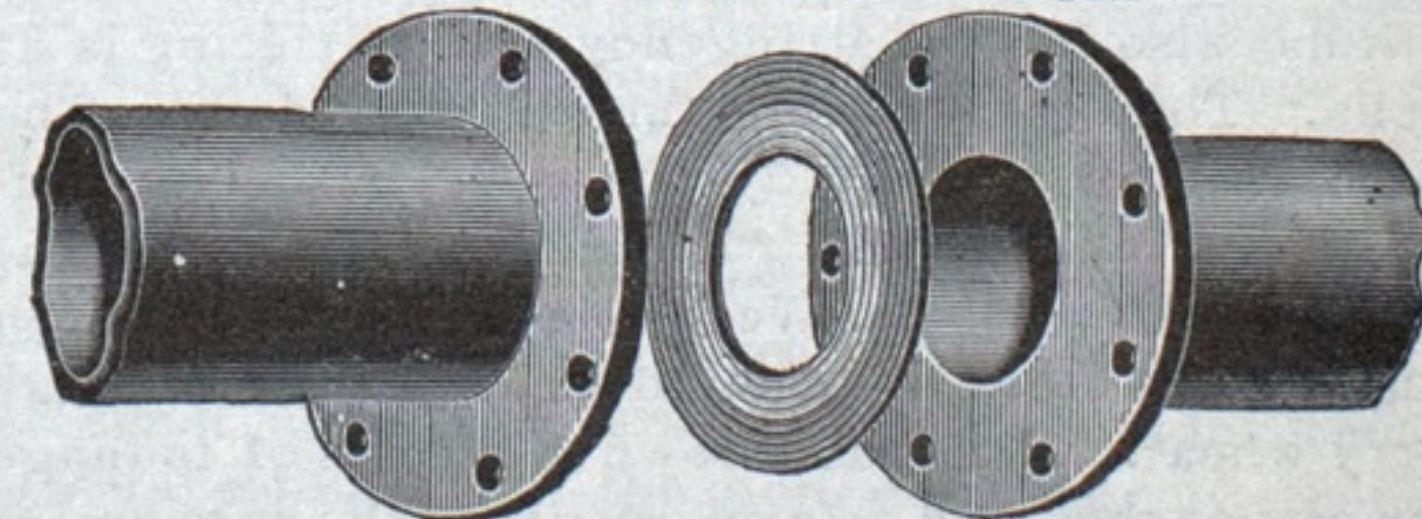
Cut No. 1 shows the steam trap gasket used for cylinder heads, condensers, pipe unions and steam heaters. Among the important advantages in their use is that they are twenty-five per cent. cheaper than rubber or copper, will not spread or corrode, the pointed ridges work into all of the surfaces and they make a reliable joint.



METAL MANHOLE GASKET.

Cut No. 2 shows the manhole and handhole metal gasket tempered to stand low and high steam pressure up to 200 pounds and as used by the Chicago Towing Co., Vessel Owners Towing Co., Illinois Steel Co. and other large firms where the best and most reliable only are in demand. These gaskets have been thoroughly tested and are guaranteed to be lasting and efficient besides being taken in exchange for new one ones at one-third the original value.

METAL FLANGE GASKET.



Cut No. 3 illustrates the metal flange gasket made to fit inside of the bolt circle as per gauge for standard flange couplings, though gaskets of special or any width are also manufactured to order.

The Guillott Metal Gasket Co. make a specialty of manufacturing all kinds of water tube boiler gaskets and a stock is always kept on hand for the Stirling boiler and the Heine safety boiler tubes.

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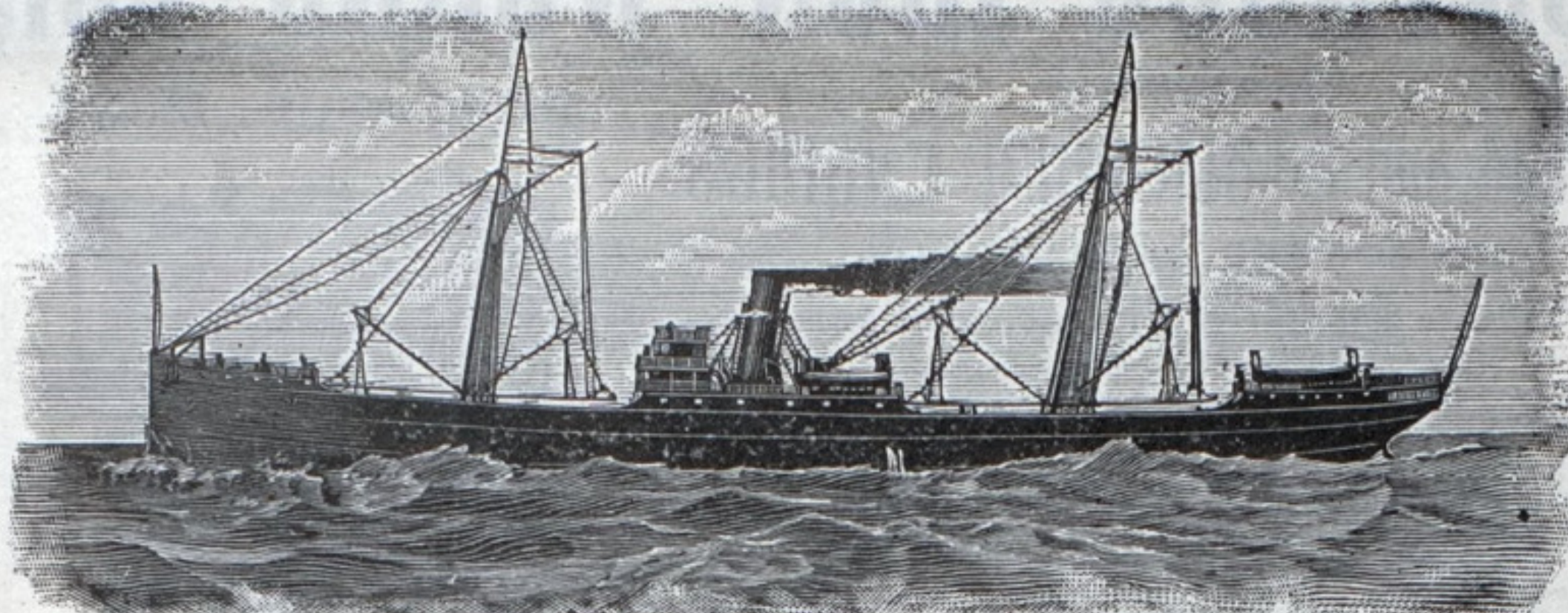
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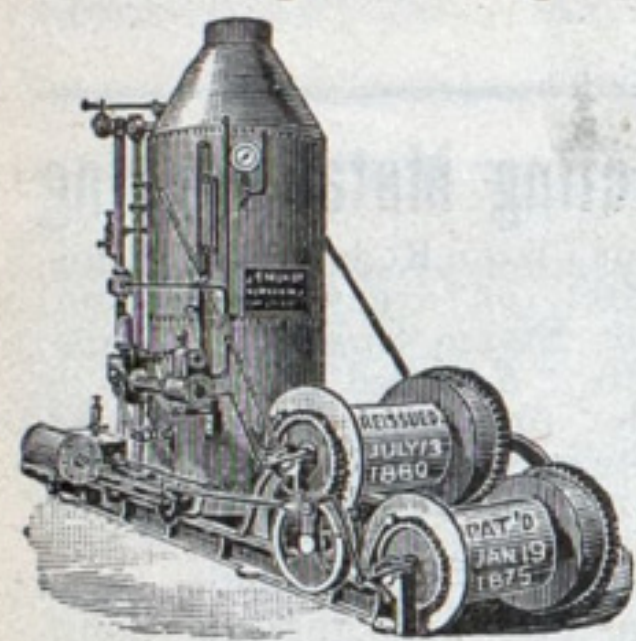
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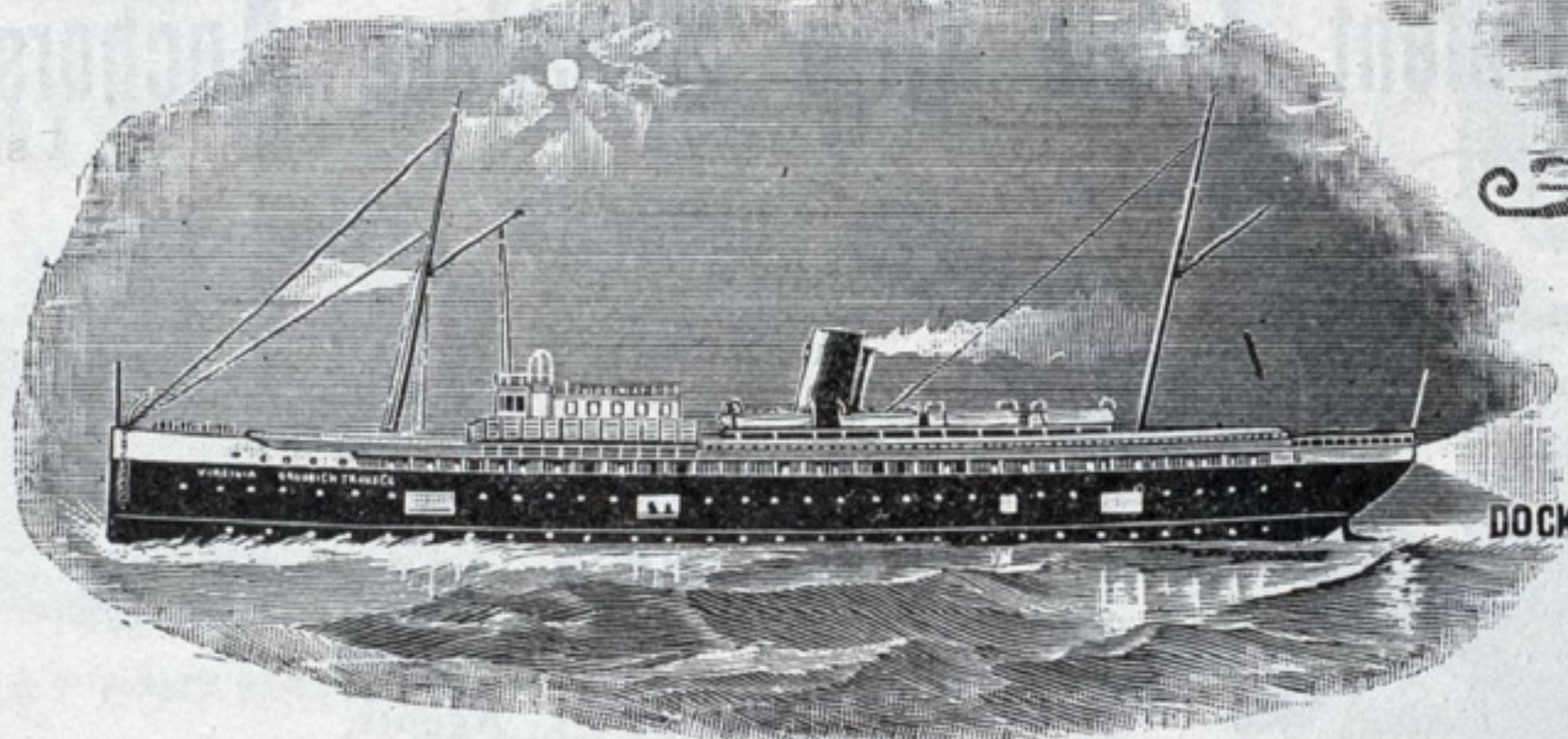
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82

OFFICE OF THE LIGHT-HOUSE ENGINEER, SEVENTH DISTRICT, New Orleans, La., June 2, 1894. Sealed proposals will be received at this office until 2 o'clock p. m. of Tuesday the 3d day of July, 1894, for furnishing materials and labor of all kinds necessary for the completion and delivery of the metal work required for increasing the height of the tower at Key West, Florida. Plans, specifications, forms of proposal, and other information may be obtained on application to this office. The right is reserved to reject any or all bids, and to waive any defects. **JAMES B. QUINN,** Major of Engineers, U. S. Army, Light-House Engineer, Seventh District.

23-26

4TH OF JULY RATES

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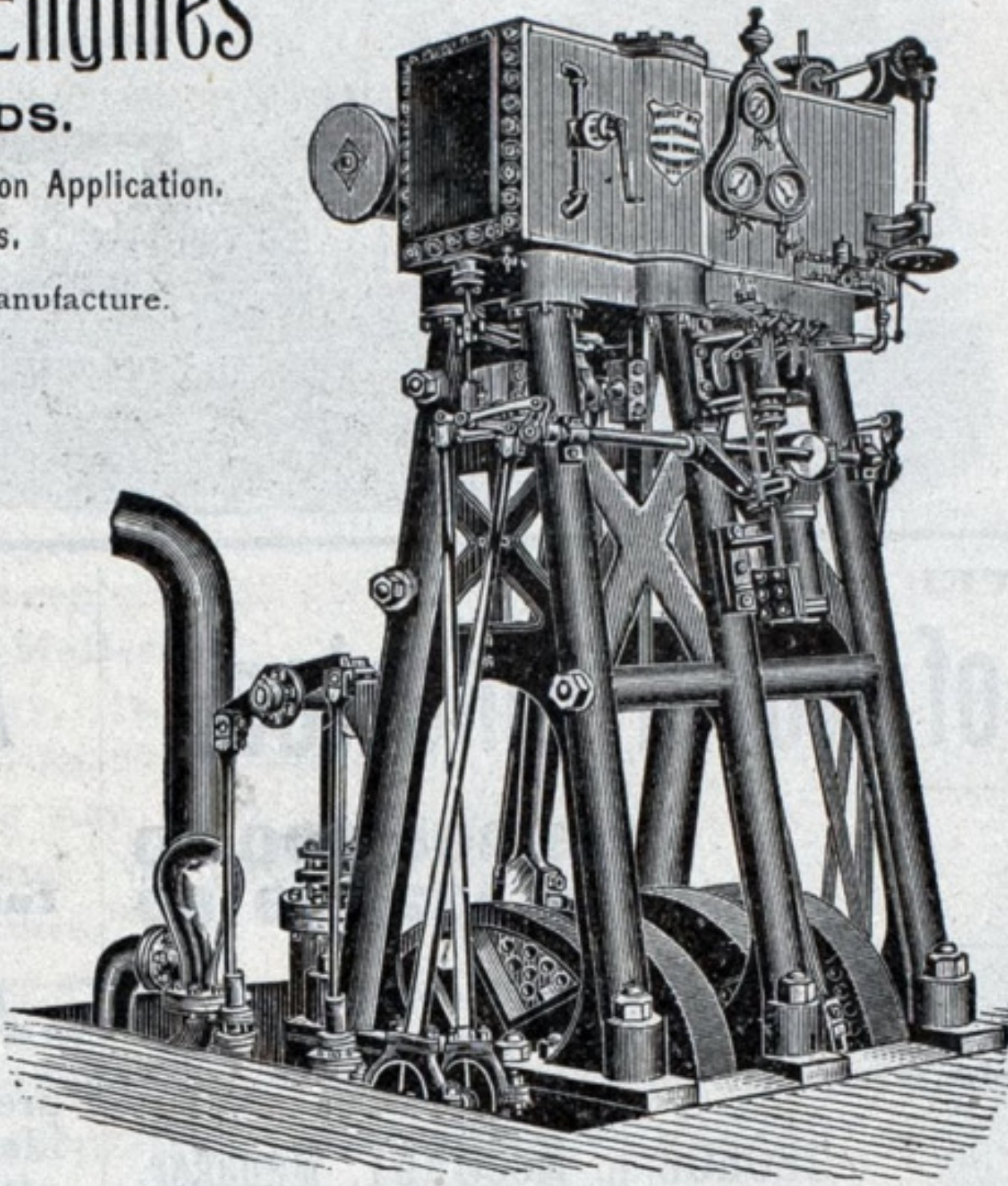
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Mark B. Covell, Manistee, 18 and 30x26.
Passenger and Freight Steamer, Bon Voyage, Saugatuck, 16 and 30x26.
Tug, Hunter, Chicago, 15 and 28x22.
Tug, Edward G. Crosby, Muskegon, 16 and 30x24.
Oval Agitator, Chicago, 14 and 28x20.
Tug, Peter Coates, Sault Ste Marie, 10 and 20x16.
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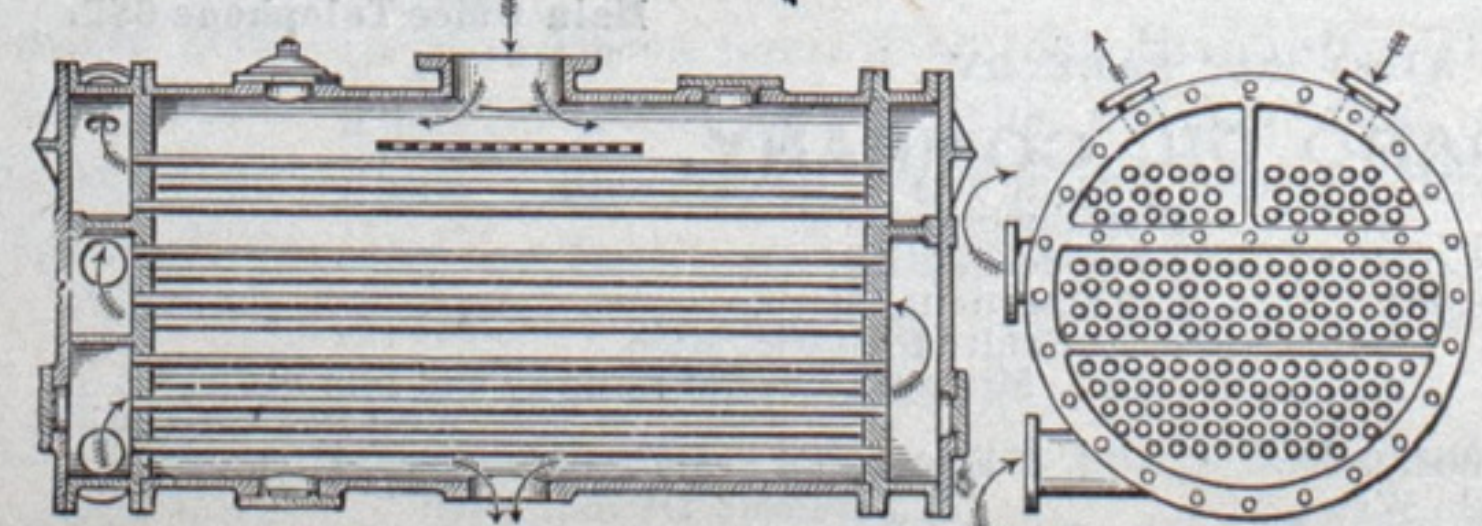
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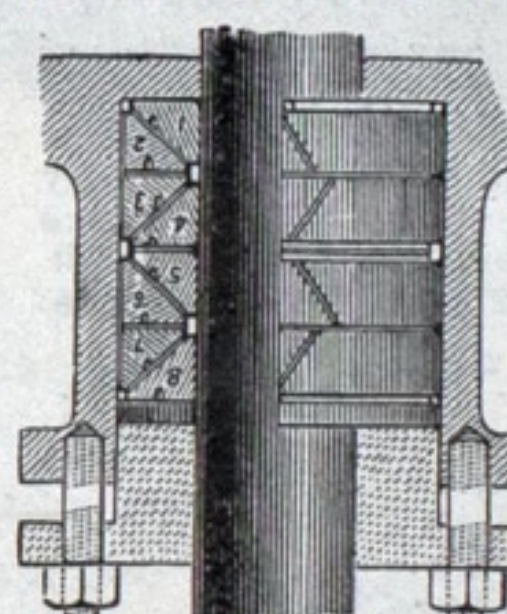
Y. P. S. C. E. SOUVENIR.

An edition of the Souvenir Maps of the Y. P. S. C. E. Convention to be held July 11th to 15th, at Cleveland, O., has been issued to the Nickel Plate Road, the shortest through passenger line between Buffalo and Chicago. Any person who expects to attend this Convention and desiring one of these maps can have same forwarded to his address, free, with the compliments of this popular low rate line.

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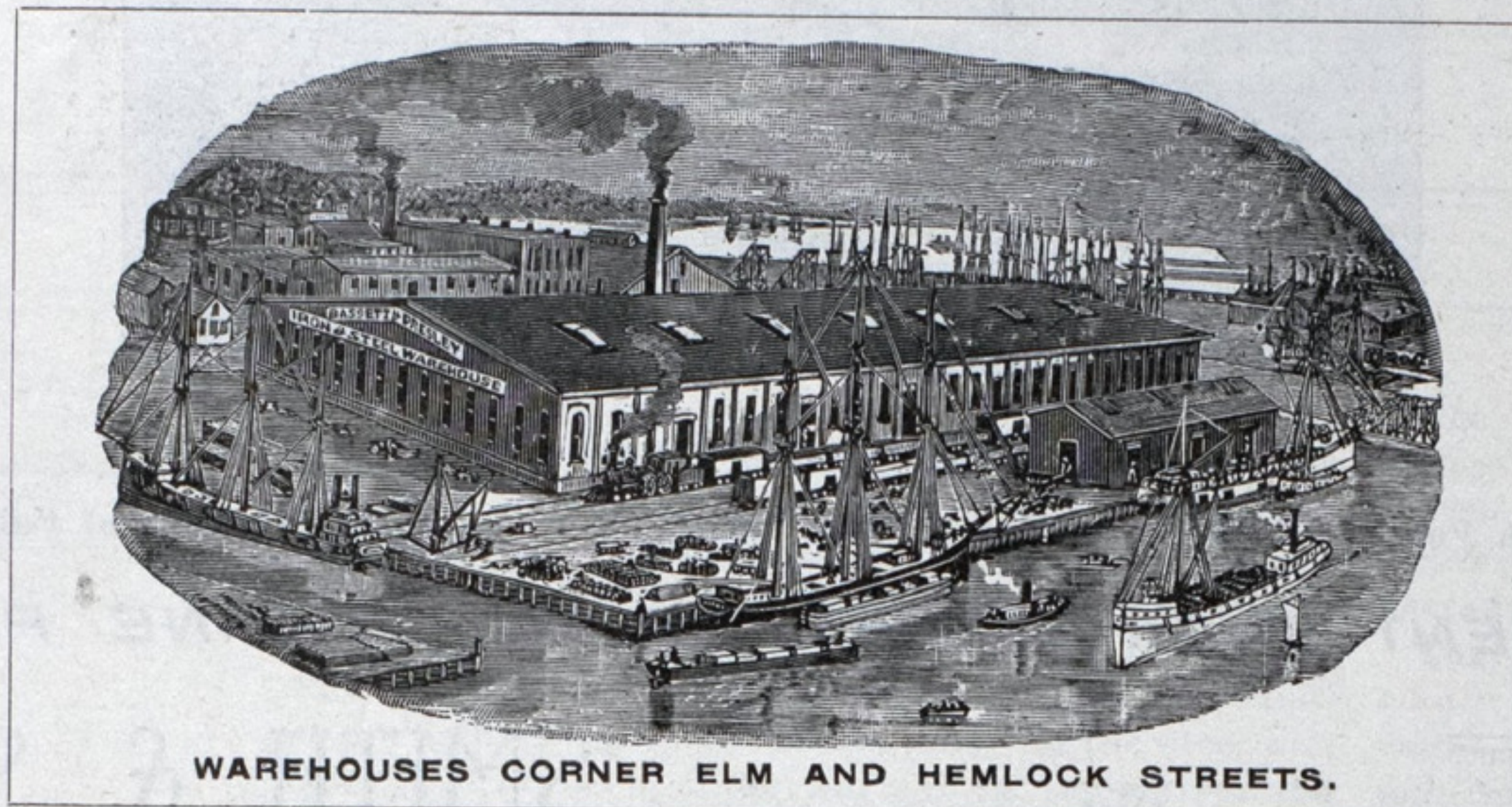
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TUG MONARCH.—Engine Compound, Cylinder 16 & 30 in. diameter, 30 in. Stroke, Steam Pressure allowed, 125 lbs.

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THE THOMPSON TUG AND WRECKING CO., OF PORT HURON.

Have the tugs Merick and Brockway, with lighter Clinton, fitted with McMyler's Improved Revolving Derrick for quick hoisting, stationed at Sault Ste Marie, Mich., ready to do all kinds of wrecking and raft towing.

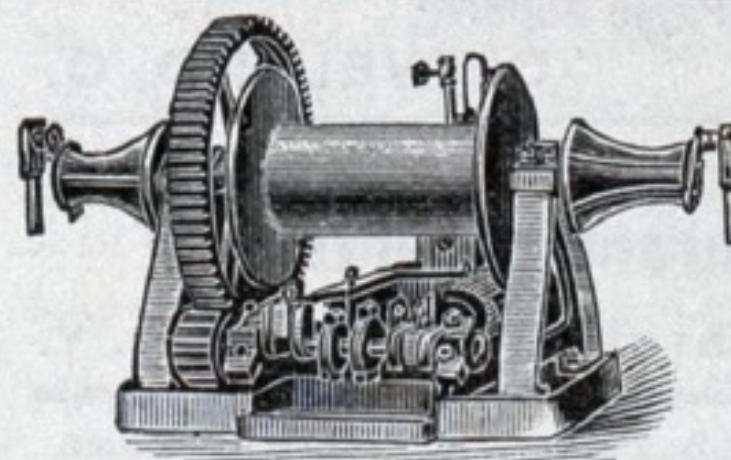
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Tug Chas. D. Thompson, tug building, engine 17 x 36 x 30, are stationed at Port Huron, and are fitted out with a complete wrecking outfit, ready to do all kinds of wrecking and raft towing.

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SIGHT UP FEED LUBRICATOR.
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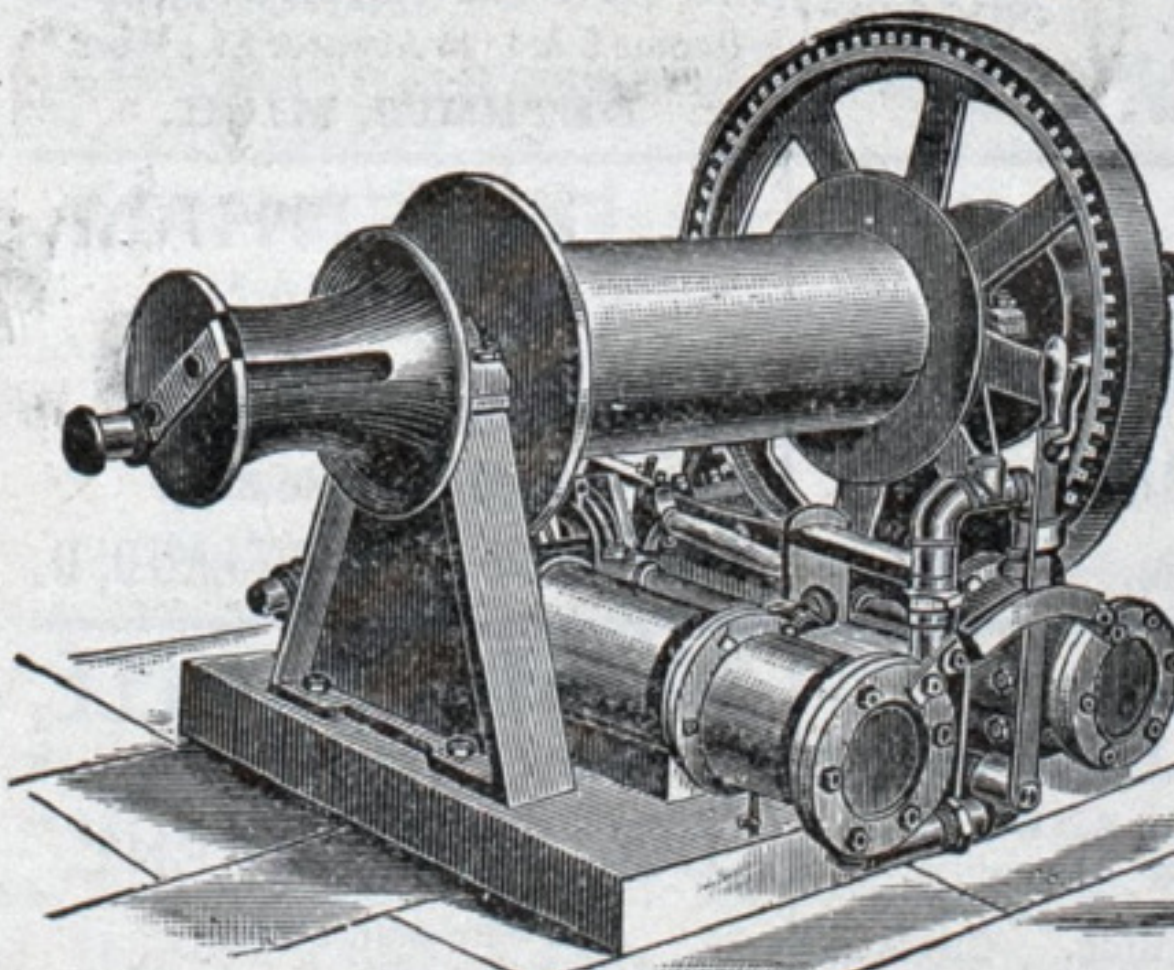
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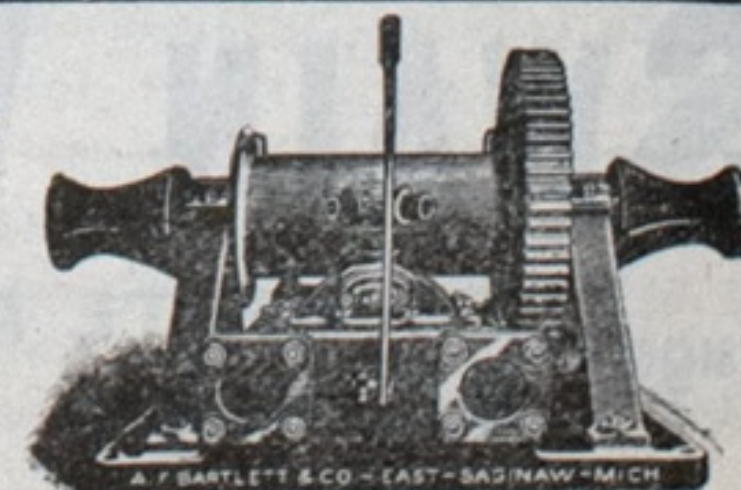


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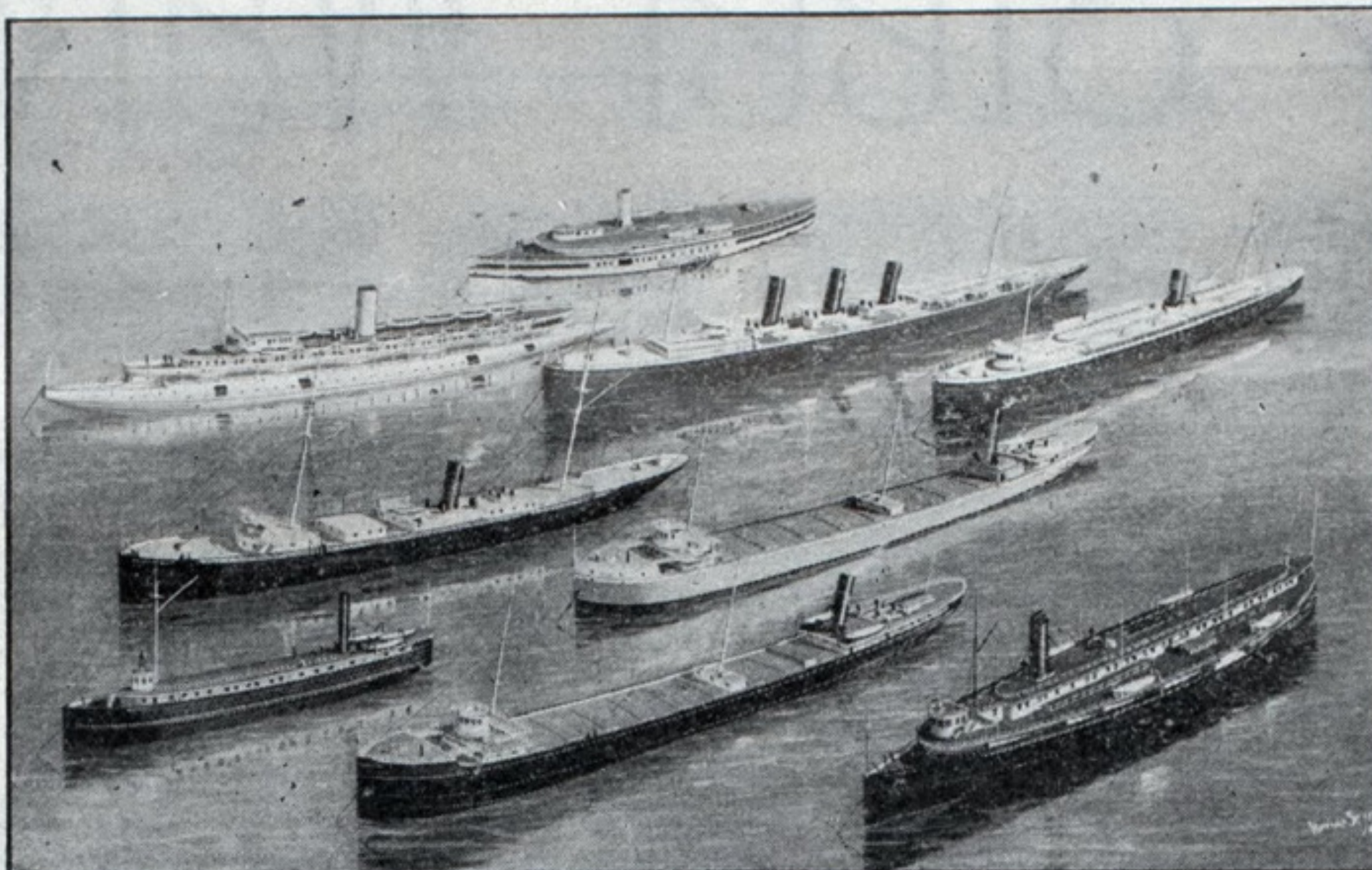
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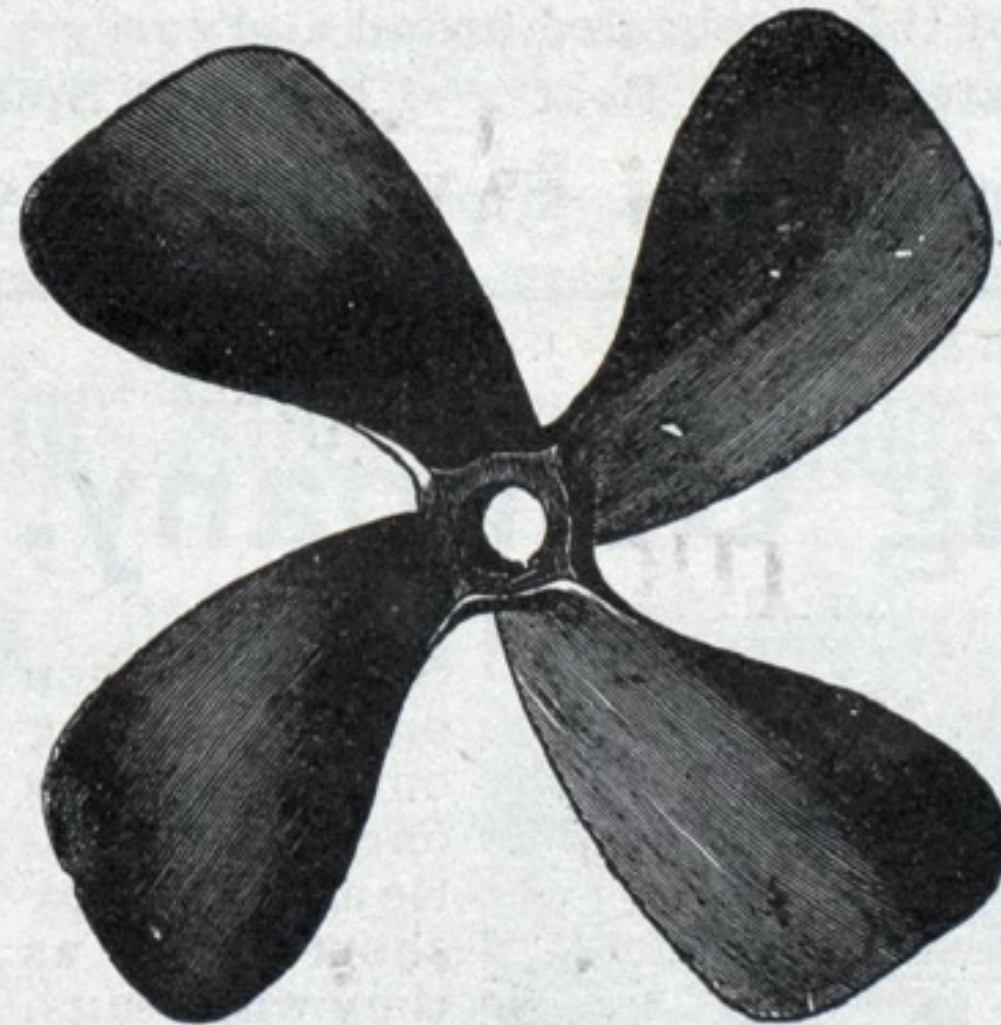
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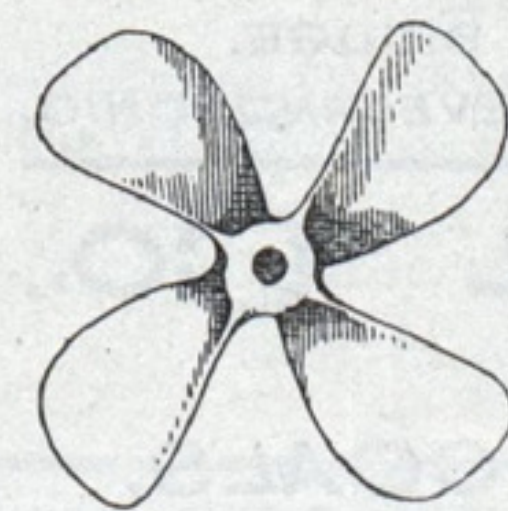
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Keel Blocks

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Width of

Gate

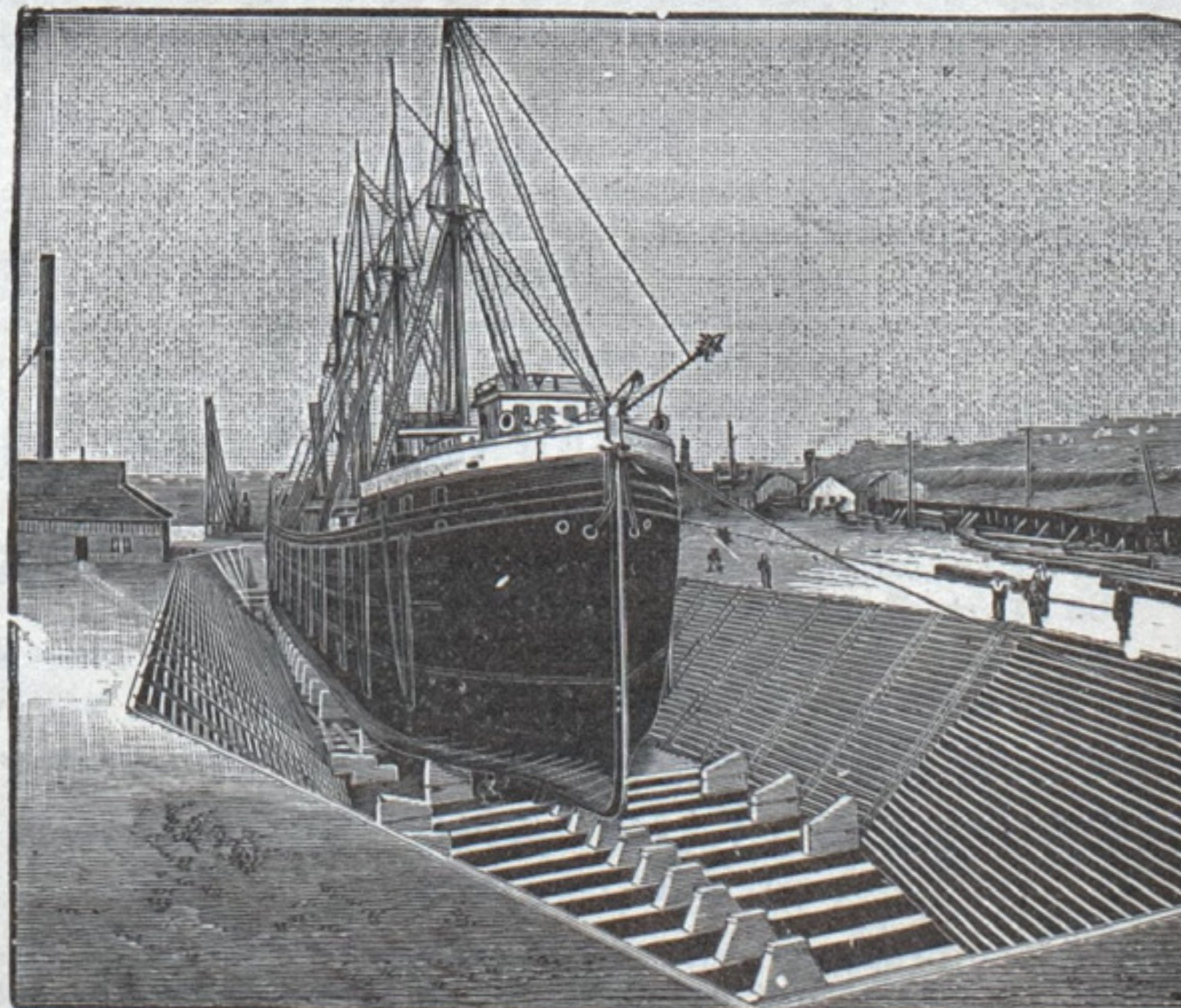
50 ft.

Depth of

Water on

Keel Blocks

16 ft.



NEW DOCK

Length of

Keel Blocks

300 ft.

Width of

Gate

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Depth of

Water on

Keel Blocks

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